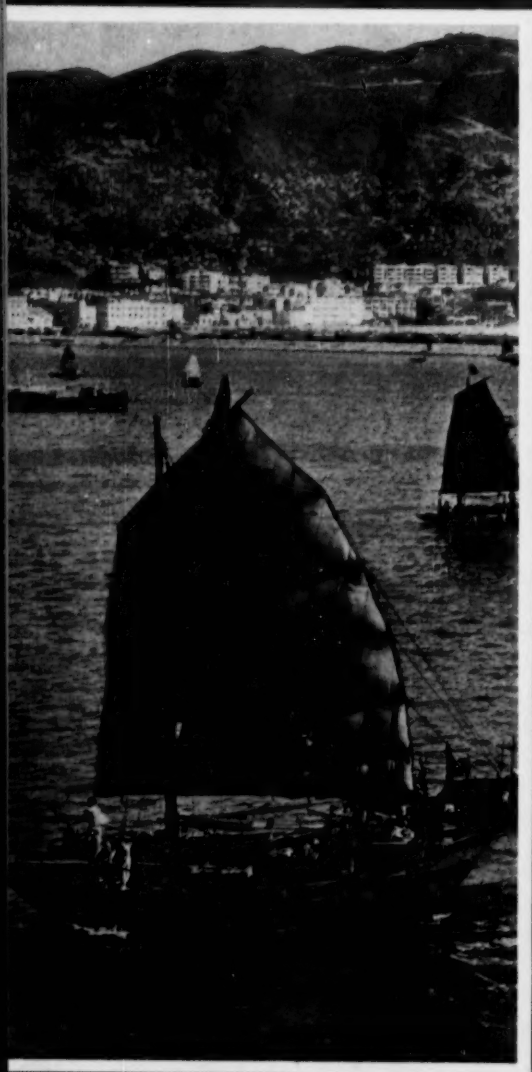


Chemical Week

October 17, 1983

Page 2



Styrene prices are expected to rise sharply in the fourth quarter, according to industry analysts. The price of styrene is expected to rise from \$1.10 per pound to \$1.25 per pound by the end of the year. This is due to a combination of factors, including a shortage of raw materials and increased demand for the product.

Formaldehyde prices will jump half a billion pounds next year, but few are worried. The price of formaldehyde is expected to rise from \$1.10 per pound to \$1.25 per pound by the end of the year. This is due to a combination of factors, including a shortage of raw materials and increased demand for the product.



Let's brush up on paint

Still leading the field in this "do-it-yourself" age are the paint industries. They're making painting easier all the time. Better pigments, vehicles, and formulations give amateurs professional results. And as paint sales roll up new records, so grow the requirements for the chemicals that make better finishes possible.

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ditions, development of new products, or additional requirements for plant expansions.

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3264

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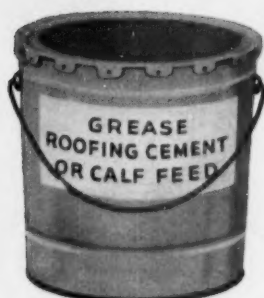
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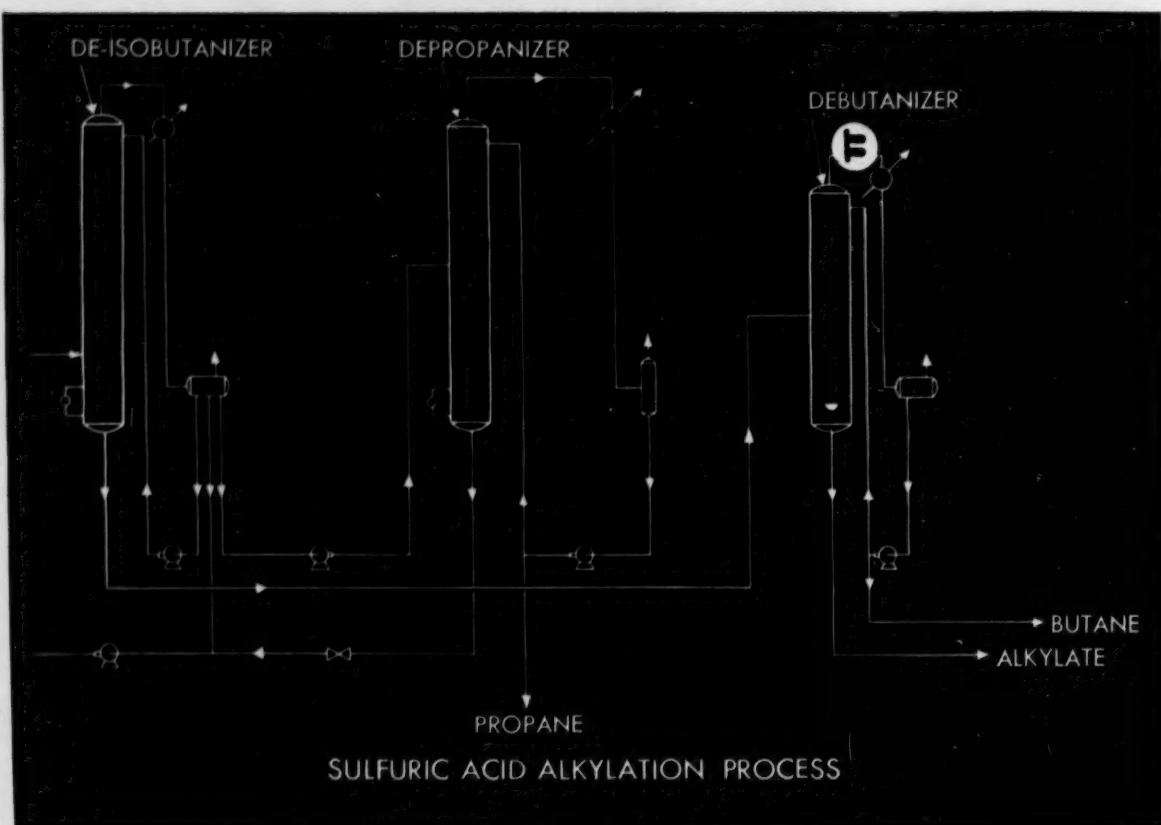
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December 17, 1955

Vol. 77, No. 25

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Chemical Week

TOP OF THE WEEK

\$280 million is the tab for Kaiser Aluminum & Chemical's new expansion program. It will boost the firm's aluminum capacity by 50%p. 18

Merger of major chemical unions will follow AFL-CIO unification—but probably not before '57p. 21

Jobs aplenty in the chemical industry as employment hits a high. Government statistician Swerdloff roughs out the pattern, fills in many detailsp. 48

Development of mental drugs is bound to build on current fundamental research. One objective: antagonists of natural substances that induce hallucinations .p. 78

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1956 will bring a near-600-million-lb./year spurt in formaldehyde capacity, add to a billion-pound excess over expected use. But surprisingly, makers aren't worried

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OPINION

Nuclear Future

TO THE EDITOR: . . . I believe that you may be missing a good bet by not presenting more of the picture of what chemical firms are doing in processing and reprocessing uranium and allied products in the atomic energy field. Since the well-publicized Geneva meetings, a good deal of informative data is available. . .

By your reporting you may inspire more companies to look into the promising field of nuclear reactor fuel processing, the utilization of by-products, potential uses of irradiated elements. . .

It should be recognized, too, that the task of removing the radioactive "garbage" that comes from existing plants is a challenging problem . . . and that there may be a potential market for such materials. . .

All these aspects, and the foreign market, represent a huge future business . . . to which you could well direct the attention of your readers. . .

WAYNE T. MCINTOSH
Nuclear Division
Glenn L. Martin Co.
Baltimore, Md.

We agree. That's why CW has reported on many nuclear developments in the past, and we can promise reader McIntosh that we'll be reporting on more next year.—Ed.

First Rights

TO THE EDITOR: Your discussion ("Casualness Can Be Costly," Nov. 26, p. 28) of the problem of employee contracts with industrial concerns is quite timely.

I dare say that nearly every technical man has at some time reflected with irritation on the company contract he was asked to sign to obtain or keep his job in a chosen and specialized field.

In the opinion of this writer, the rights of the individual come first—these are the rights that permit him the freedom of pursuing his own specialized profession for his own most profitable rewards.

A company unable or unwilling to provide satisfactory opportunities should accept the complex competitive problem that may arise as the result of an individual's leaving a company.

In protection of a company, it would seem to be fair that it should be able to protect what would be legally considered its special property—secret processes, chemicals, methods, etc.

There is no reason why it shouldn't be possible to incorporate both viewpoints into an agreement on a fair and equitable basis. . .

C. O. PIKE
Production Manager
Tape Division
Shuford Mills, Inc.
Hickory, N.C.

Plastics Outlook

TO THE EDITOR: . . . My thanks to CW for that marvelous report on plastics . . . I removed the entire section, had it put in a binder, and it now rests in my desk reference library. . .

It has already been of considerable educational value . . . I know it will continue to be a valuable reference. . .

C. L. STROCK
General Mills, Inc.
Minneapolis

SEE YOU THERE

Plant Maintenance & Engineering Show, Convention Hall, Philadelphia, Jan. 23-26.

Assn. of American Soap and Glycerine Producers, annual convention, Waldorf-Astoria, New York, Jan. 25-27.

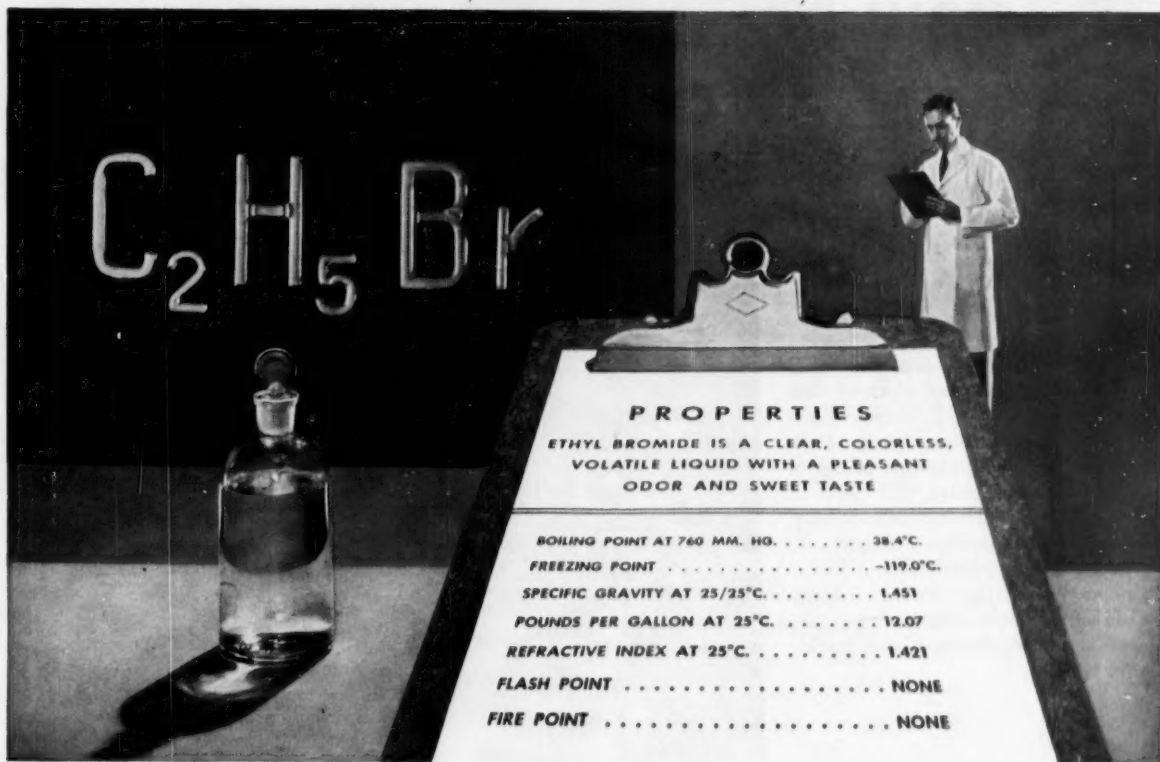
Chemical and Allied Products Buyers Group of National Assn. of Purchasing Agents, Midwestern meeting, Palmer House, Chicago, Jan. 24; Eastern meeting, Commodore Hotel, New York, Jan. 31.

Chemical Market Research Assn., aromatic chemicals meeting, Webster Hall, Pittsburgh, Jan. 31-Feb. 1.

Assn. of Consulting Chemists & Chemical Engineers Inc., symposium and banquet, Hotel Belmont Plaza, New York, April 18.

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

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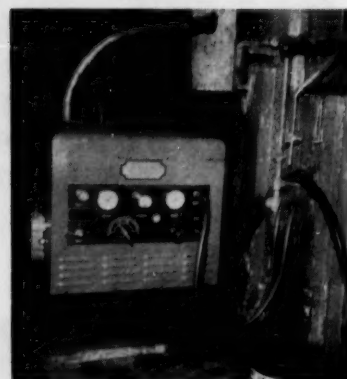
And did you know: Monsanto Santocure is the original commercially produced sulfenamide-type accelerator; with Santocure NS, it is considered a standard of the rubber industry.

Santocure NS has similar behavior in compounded rubbers as Santocure and is characterized by excellent delayed action which gives greater freedom from scorch.

Boiler leak detector using Monsanto Pydraul prevents fuel waste

A fire-resistant "fog" sprayed into either hot or cold boiler furnaces is proving one of industry's most effective devices for detecting boiler setting and casing leaks.

Pydraul* F-9, developed originally by Monsanto as a fire-resistant hydraulic fluid, is specified as the fogging agent by the Products Division of Todd Shipyards Corporation, Brooklyn, N. Y., for use in the company's industrial fog applicators.



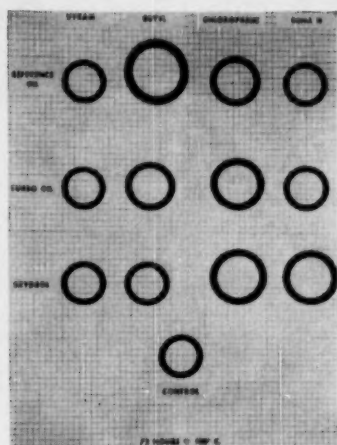
Testing for boiler leakage. Pydraul fire-resistant fluid, the fogging medium, assures complete freedom from fire hazard.

Consolidated Edison of New York, with whom Todd Shipyards' Products Division cooperated in developing this revolutionary form of boiler leak detection, has conservatively estimated that annual savings in fuel and maintenance costs will be in the neighborhood of \$100,000.

While previous methods of determining boiler leakage—candles held along boiler casings, burners, boiler furnace doors, etc.; soapy water and smoke bombs—were used with some success, they were inefficient and costly in man power and equipment down-time during tests.

For more information about Pydraul fire-resistant fluid and Todd Industrial Fog Applicator (TIFA) equipment, check the coupon.

Note: Pydraul F-9 is the first and only fire-resistant hydraulic fluid listed by Underwriters' Laboratories, Inc.



Vyram O-rings (vertical column, far left) show no signs of swell or distortion even after prolonged immersion tests.

New elastomer highly resistant to hydraulic fluids and many solvents

Monsanto's Vyram* is a remarkable synthetic elastomer which resists the swelling action of both synthetic and petroleum-base hydraulic fluids and lubricants.

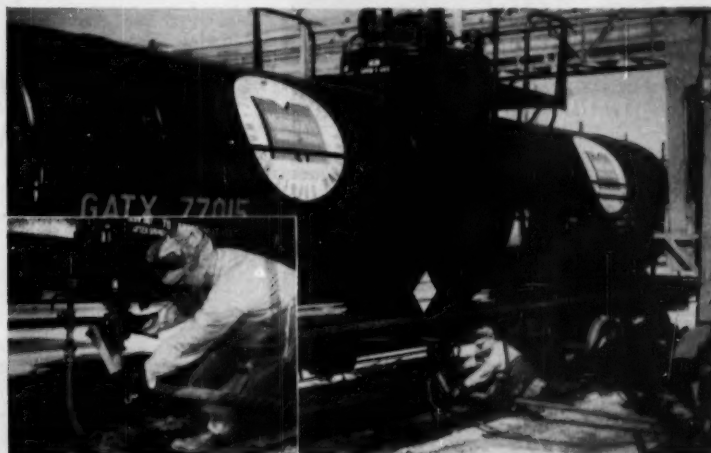
Proved by extensive tests, Vyram has demonstrated its ability to withstand the chemical action of a variety of solvents and other fluids.

Comprehensive immersion data on Vyram in alcohols, aldehydes, amines, esters, ether, glycols, hydrocarbons, ketones, oils, substituted hydrocarbons and functional fluids are presented in a new technical bulletin just issued on Vyram.

Also included in the bulletin are physical properties, compounding data, processing information and a summary of properties imparted by various curative systems.

If you manufacture elastomeric seals, Vyram may be just the material you've been looking for. For technical information, check the coupon and mail today.

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| <input type="checkbox"/> Booklet, "Pydraul F-9" | <input type="checkbox"/> Booklet, "The Handling of Phenol" |
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Business

Newsletter

CHEMICAL WEEK
DECEMBER 17, 1955

Speculation—much of it founded on what appears to be sound ground—was circulating throughout the industry last week on the recent activity in certain chemical stocks.

Rising popularity of Merck, the experts say, stems from the prospects of a relatively new drug—Cathomycin. Still in preliminary test stages, the antibiotic has a fairly wide range of activity, is expected next year to push Merck net well past the \$1.50/share it should chalk up this year.

Strength of Smith-Douglass, on the other hand, is again apparently founded on merger whispers.

And across the Atlantic, a sudden spurt of interest in Interhandel common seems to have been a direct result of recent Senate Judiciary subcommittee hearings in Washington (*CW, Dec. 10, p. 18*). Years of frustrating litigation had virtually convinced most Swiss investors that the attempt to free General Aniline & Film Corp. from U.S. ownership was doomed to failure.

Now, however, many leading Swiss businessmen believe that the tenor of U.S. public opinion has started to turn, and that return of GAF to its prewar owners is only months away.

•
Stepping into new production early in the New Year—via the acquisition route—will be three chemical process companies.

Heading the parade: Minnesota Mining & Manufacturing Co., which last week purchased a controlling interest in Hartford City (Ind.) Paper Co.

Moving into the rare earths business: Michigan Chemical Corp., which has acquired the assets of Saturnium Corp. (California, Ky.).

Acquiring a new product line: Koppers Co., Inc. (Pittsburgh), which has purchased a controlling interest in Durethane Corp. in a straight cash transaction. Durethane produces polyethylene film and tubing.

•
Behind the word that Tennessee Products & Chemical Corp. will build a \$2.5-million ferroalloy electric furnace plant at Rockwood, Tenn., is the suggestion that company officials may be reshuffling its facilities prior to breaking into a new production field.

Tennessee Products (a division of Merritt-Chapman & Scott) currently operates 13 diversified plants in the South. This latest plant will be equipped with six electric furnaces, and will be adaptable for production of ferromanganese, ferrochrome, ferrosilicon, silicomanganese and other ferroalloys.

•
Reichhold Chemicals, Inc., is negotiating for a 30-acre plant site in the Tacoma, Wash., tideflat area. When acquired, the acreage will be the site of Reichhold's 13th U.S. plant. It will produce dry adhesives, pentachlorophenol and muriatic acid.

•
Building up its Calvert City concentration of chemical producing units, Air Reduction Sales Co. (division of Air Reduction Co., Inc.) will put in a new oxygen plant. Expected onstream sometime in the spring of 1956, the plant will supply a portion of its output (by pipeline) to American Aniline and Extract Co.'s plant—now under construction at Calvert City.

•
Another of the former government-owned synthetic rubber plants is due for a major expansion early in 1956

Business Newsletter

(Continued)

Its current owner, Petroleum Chemicals, Inc., will invest \$4.3 million in increasing butadiene capacity (at Lake Charles, La.) from 63,000 tons to 79,000 tons annually.

Making a strong bid last week for establishment of a synthetic rubber industry was the Province of Alberta, Canada.

Claiming (in a brief to the Gordon Economic Commission, studying Canada's economic potential) that its vast supplies of natural gas make it a logical top candidate for expansion, Alberta government officials bluntly point out that if Canadian firms don't make an expansion move soon, U.S. firms are sure to step into a "potentially powerful production region."

A measure of the West German chemical industry's spectacular growth was revealed in Bonn this week. In the year now closing, Farben-fabriken Bayer, one of the larger successor companies of I.G. Farben, will have invested DM 210 million (\$50 million) in new plants and equipment on top of a \$44-million investment in 1954.

Sales will amount to \$310 million (compared with \$290 million in 1954), and exports (which last year brought in \$107 million) will this year increase to more than \$119 million—or 37% of total sales.

Complications caused by recent Canadian legislation controlling international water development have led Frobisher Ventures to temporarily shelve its \$700-million hydroelectric and metallurgical project straddling the British Columbia-Yukon border.

Instead, Frobisher, Ltd. (a subsidiary of the worldwide holding group) will concentrate on an entirely new, \$50-million, 335,000-kw. power development on the Nass River in Northern British Columbia.

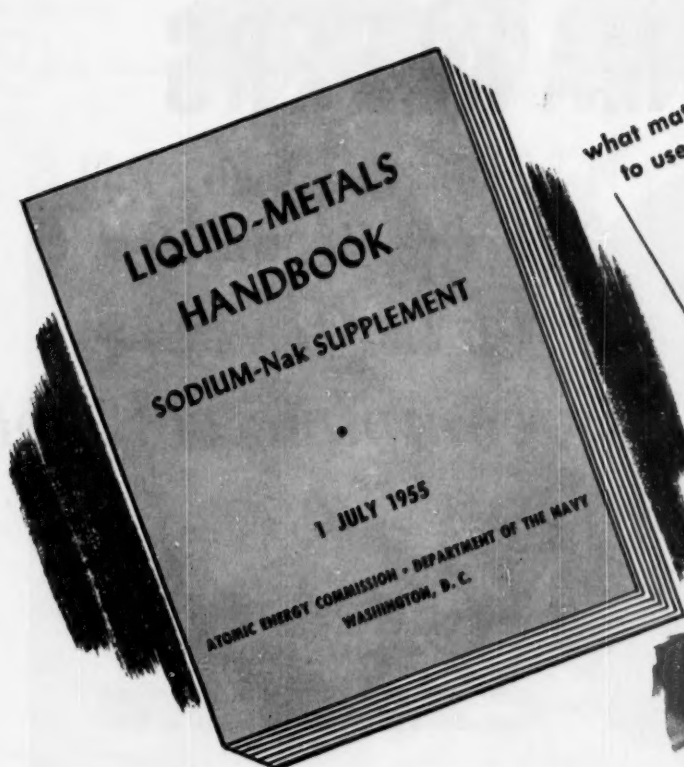
East European trade in southeast Asia will be a considerable threat to Japanese industry within the next few years. According to latest estimates: East European Communist countries will have exported \$250 million in goods to southeast Asia this year. Accounting for a large percentage of the total: Polish textile chemicals to Indonesia, Rumanian industrial chemicals to both India and Indonesia.

A state geologist in Stockholm, Sweden, claims discovery of what is alleged to be the world's largest uranium field, with reserves estimated at 1 million tons.

Located in central Sweden, near Gothenburg, the field's aluminum shale is reported to contain 300 grams/ton of uranium.

An evaluation that could open up a whole new field for application of plastics is being quietly pressed forward by Clark Thread Co.

Fashioning thread spools from Dow-produced polystyrene, the company claims the innovation could supplant the more conventional wooden spools now in use throughout the world.



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of large-scale heat
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BUSINESS & INDUSTRY . . .



BARNES: Wants rules for WOC's extended . . .

HARRIS & EWING

Permitting No Loopholes

The Congressional investigation of the conduct of businessmen in government was broadened last week to question whether chemical companies, by voluntarily allocating a portion of their 1953 ammonia and toluene production to the government, may have run afoul of the antitrust laws.

The committee is referring its file on this voluntary allocation to the Justice Dept. for a specific ruling on whether BDSA's Chemical and Rubber Division and the companies that make ammonia and toluene have violated the law.

While Stanley Barnes, who heads the Justice Dept.'s Antitrust Division, said he could venture no opinion without knowing the exact facts of the case, he indicated he would assume

that parties to a voluntary agreement "would want to obtain the protection" the Defense Production Act allows.

Thesis of the committee's complaint is that the voluntary allocations set by BDSA (in 1953) were not established under the provisions of the Defense Production Act that authorize voluntary allocations. Rather, they were set by BDSA personnel.

While counsel for the House Antimonopoly subcommittee see no cause for action against career personnel of BDSA in this regard, they feel that companies acceding to such requests may therefore be shown guilty of concerted action. And, accordingly, they have asked chemical companies involved to produce their records on the entire transaction.

Sellers of selenium pigments, too,

may come under government scrutiny, as a result of the broadened investigation. Probers criticized BDSA for not turning over to the Justice Dept. (or to the Federal Trade Commission) complaints charging that pigment suppliers are refusing to sell selenium to glassware makers unless they also buy cadmium.

Major Trouble Spot: It was over the question of such advisory group meetings that witnesses differed most violently. Whereas, on the one hand Charles Honeywell, BDSA administrator, defends the use of WOC's (without compensation) in presiding over meetings of industry advisory committees, Barnes just as positively feels that only full-time, salaried government workers should serve as committee chairmen. Barnes told Congressmen that he was drafting rules for possible issuance as a Presidential order, which would set down procedures such committees should follow—but Honeywell made clear that until such a rule is issued, WOC's will still preside at committee meetings.

Honeywell also revealed that because of the Presidential order, which requires listing of financial data by WOC's and consultants, his agency has scrapped its roster of industry consultants, and also plans to replace, with salaried officials, the WOC's who are now serving as assistant administrators of BDSA.

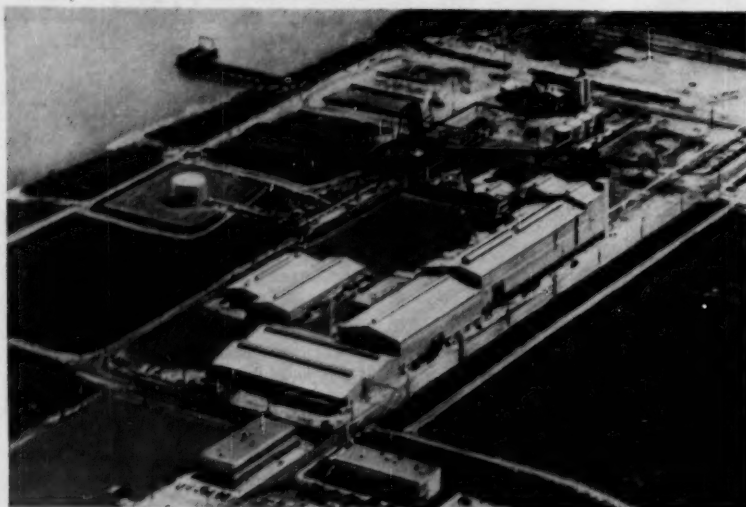
Fourteenth Mill

Continental Uranium, Inc., has signed a contract with the Atomic Energy Commission for construction and operation of a uranium processing mill at La Sal, Utah.

Construction starts immediately; the plant is scheduled for completion by summer, 1956.

According to terms of the agreement: Continental will own and operate the mill, and the entire output (of uranium concentrates) will be purchased by the commission.

There are 13 other uranium processing mills in the general area.



IN GEORGIA: American Cyanamid's new \$15-million titanium dioxide plant near Savannah adds to . . .

Developments in Dixie

Two new chemical plants in Georgia this week point up once again the contention that industry in the South is moving into a position of major importance in the U.S. economy.

For American Cyanamid, dedicating its \$15-million titanium dioxide plant on the south shore of the Savannah River, a few miles from the heart of downtown Savannah (see *Market Newsletter*, p. 101), the occasion marks the advent of the company's third plant in Georgia—and its twentieth south of the Mason-Dixon line. Within the past 10 years, company spokesmen claim, American Cyanamid has built (or acquired) four plants in the South, providing work for some 1,500 employees, and boasting an annual payroll in excess of \$6 million.

Plant site for the newest addition—the Savannah titanium dioxide plant—is a 1,600-acre plot known as the Deptford tract, containing historic Fort Jackson, which was part of the city's defenses during the Civil War.

Cross-State: Meanwhile, at Rome, Ga., some 300 miles north and west of Savannah, directly across the state, Celanese Corp. has started production of Fortisan-36, a new industrial fiber (*CW Market Newsletter*, Dec. 10, p. 100).

Though company officials say that Celanese will make a modest start,

production-wise, with only two of its 12 spinning banks in operation, peak production at the plant will turn out 16 million yds./day of Fortisan-36.

Over-all Picture: These two latest chemical plants are, however, only part of the expansion picture.

Latest tabulations show that the chemical industry in the South is adding an average of \$2 million in new construction every day.

The finishing touches are currently being put on \$555 million worth of new chemical facilities; another \$225 million worth is now on the drawing boards.

And, staggering as these figures are, the outlook for the future is even brighter.

Industry observers foresee the possibility within the next 10 years of over 300 new chemical plants in the South, employing (at a minimum) some 10,000 additional chemists and chemical engineers.

How much this rush of industry has already meant to residents in the area is clear from these facts:

- Since the close of World War II, the agricultural population of the South has decreased one-third, and now represents only 20% of all residents.

- Per capita income gains are running almost 50% ahead of the U.S. national average.

For Letup on Trade

A drive is shaping up this week to liberalize the workings of the Anti-dumping Act of 1923—a law that has long been regarded by major segments of the chemical industry as a principal defense against unfair foreign competition.

The National Antidumping Committee has just been organized in Washington to seek clarification of the standards used in applying and enforcing the law. It'll try to get that clarification through administrative memos and directives if possible, through new legislation if necessary.

Coincidentally, another move on this same subject may come from the Tariff Commission. That agency is considering asking Congress to clarify the definition of "injury" to a domestic industry.

Strict but Limited: The National Antidumping Committee now is made up of some 30 importers and exporters with a scattering of law firms that specialize in antidumping cases and of farm and labor organizations. It expects membership of over 100 soon.

Announced purpose of the committee: to press for strict enforcement of the law against "genuine" dumping—but to limit the law's application to such cases only.

In the recent past, the committee contends, the antidumping law has been used to impede trade in cases that did not involve real dumping—of the flagrant type practiced by I. G. Farben in the 1920s—or result in injury to domestic industry.

Lobbying as Last Resort: Three kinds of activity are planned by the committee:

- A campaign to educate Congress and the public on issues relating to the antidumping law.

- Close cooperation with Treasury and Customs officials in an attempt to liberalize administration of the law.

- Direct lobbying among Congressmen if it appears that Congress is likely to amend the law.

Formation of the committee was sparked by a recent Treasury decision to impose antidumping duties when—according to committee leaders—only a small segment of the domestic industry could have been hurt. To this, a maker of synthetic organic chemicals might reply: Why wait until a large part of the industry is crippled?



BURGESS, GREENWALT: Take the offensive in a . . .

Drive for Lower Taxes

The high corporation tax rate and the steep progression in individual income tax brackets have sharply curtailed the supply of equity capital for expansion in the chemical industry. That was the contention of Ralph Burgess, economist of American Cyanamid Co., before the Joint Economic Committee's long-range tax hearings in Washington last week.

While these two factors serve as a deterrent to capital formation throughout industry, Burgess made the point that the impact on the chemical industry was more acute because of the high rate of obsolescence of equipment and products and because of the high rate of research spending in the industry.

"The chemical industry requires more capital than most industries," Burgess told *CW*, "and that makes the problem more pressing."

Burgess told the subcommittee on tax policy, presided over by Rep. Wilbur Mills (D., Ark.), that federal taxes are an important factor in the trend away from equity financing. "Corporation taxes place a penalty on the issuance of stock," said Burgess, "for full income tax must be paid on income used for dividends, whereas money used to pay interest on debt is free of tax."

From the standpoint of encouraging long-term growth of the economy, Burgess recommended (1) reduction of

the high individual income tax rates, (2) a lessening of the degree of progression, (3) further relief of the double taxation of corporate earnings, and (4) liberalization of the treatment of capital gains and losses.

However, from a short-run stability standpoint, Burgess opposed a cut in taxes now. "The economy is now delicately balanced on a high plateau," he told the subcommittee, "and a tax cut now would lead to inflation." He said the situation calls for a flexible, day-to-day monetary policy. If there is a downturn in the economy, Burgess conceded that the economy might benefit from a tax cut.

"But the process of legislating taxes lacks flexibility," said Burgess. "I lean toward the exercise of monetary controls to offset moderate declines in the economy."

Du Pont View: Crawford Greenwalt, Du Pont president, appeared before the subcommittee to argue for tax concessions in behalf of attracting top-flight young talent to management.

Greenwalt said he sees two problem areas, tax-wise, in this connection: (1) the effect of high taxes on long-range money incentives is making it increasingly difficult to persuade able young men to enter industry; and (2) the increased difficulty in persuading capable older employees (close to their top earning capacity) to keep on working.

Donald Woodward, chairman of the finance committee of Vick Chemical Co., told the subcommittee in its opening session that an anticipated surplus of around \$3 billion in the cash budget next July 1 should be used to retire a part of the national debt of some \$280 billion. "Now is the time to reduce the debt, if we are ever to reduce it," Woodward said.

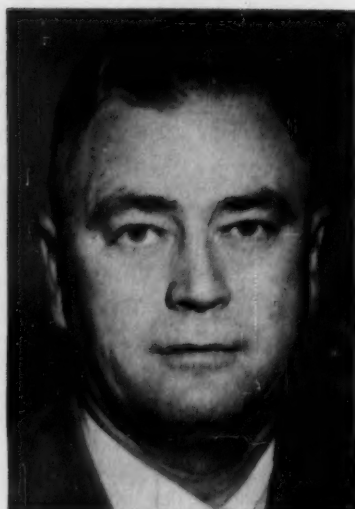
Wider Wage Ruling

Nationwide minimum wage rates in chemical and other industries have been granted another lease on life. The U.S. Court of Appeals at Washington has reversed the district court in that city, thus leaving intact the authority claimed by Secretary of Labor James Mitchell to set those pay scales on a country-wide basis.

Last spring, District Judge Alexander Holtzhoff had ruled in favor of a group of Southern textile companies, whose contention was that the Walsh-Healey law required the Secretary of Labor to establish minimum wage rates within any given industrial classification only on a state or local basis (*CW*, April 16, p. 17).

Mitchell—whose avowed intention is to use the Walsh-Healey Act as a means of boosting Southern wage rates up to Northern and Western levels—asked the circuit court to review Judge Holtzhoff's decision. The result: a tentative victory for Mitchell and the country's labor unions. The higher court declared last week that the Secretary does have power to establish a nationwide minimum wage in each industrial category for companies that hold contracts with the federal government. In the particular case being argued, the appeals court upheld the \$1/hour minimum wage that Mitchell had decreed for producers of cotton and silk textiles. Presumably, whatever applies to one manufacturing industry will hold for all others.

But the circuit court's ruling is far from the end of this battle. The textile group says they're going to fight another round, so chances look good for this case to go on to the U.S. Supreme Court. Among chemical industry branches now covered: industrial chemicals, paints and varnishes, fertilizers, drugs and medicines, cosmetics, soaps and detergents, photographic supplies and explosives.



RHOADES: Predicts that U.S. aluminum consumption will . . .

Double by 1965

Two major developments in the hot aluminum production race made top news last week.

The first—a \$280-million expansion program—will raise Kaiser Aluminum and Chemical Corp.'s production capacity by 50%, to a total of 654,000 tons/year. And the second—word that Olin Mathieson has chosen Cresap, W. Va., as the site of its \$85-million plant—will add an additional 60,000 tons of aluminum to U.S. capacity by 1958. (*CW Business Newsletter*, Nov. 26, p. 11).

And from a purely regional viewpoint: the dual move will make West Virginia one of the country's most chemically industrialized states within the next 19 months.

Kaiser Plans: Major projects to be included in Kaiser's expansion program will be construction of a 220,000-ton aluminum reduction plant at Ravenswood, W. Va. (to cost \$120 million), and a 500,000-ton alumina plant on the Mississippi River near Gramercy, La., to cost \$60 million. It's now planned to break ground for both these facilities in April '56.

To provide chemical units and a broad range of additional mill fabricating units, an additional \$100 million has been set aside.

"Our decision to go ahead immediately on such a broad expansion program," admits D. A. Rhoades, Kaiser vice-president and general man-

ager, "is based on recent market surveys that reveal that the usage of aluminum in the U.S. by 1965 will be over 8 billion lbs." (Consumption today: 4 billion lbs.)

Kaiser's choice of Ravenswood as the site for its aluminum reduction plant is significant.

The plant will be connected by economic water transportation with Kaiser's alumina plants and its Jamaica bauxite deposits. In addition, within a 500-mile radius of Ravenswood is more than 70% of the nation's aluminum usage. Also, there is readily available the assurance of an adequate long-range supply of economical power derived from coal.

The presence of coal—and coal-based generation of power—was a leading factor in Olin Mathieson's final decision to go to Cresap. "Fuel costs of producing power," said a company spokesman, "is of cardinal importance in building an aluminum plant today."

EXPANSION

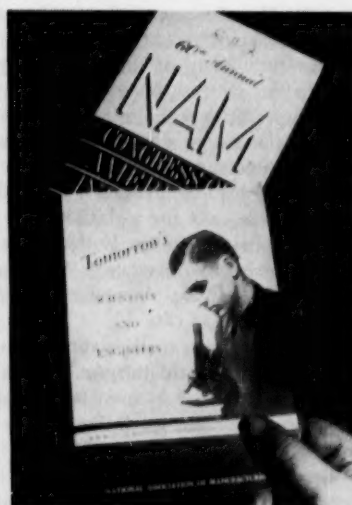
Phosphoric Acid: U.S. Industrial Chemicals Co., division of National Distillers Products Corp., will build a new acid plant at Tuscola, Ill.

Capacity: 60,000 tons of 75% phosphoric acid annually; estimated date of completion: late 1956.

Synthetic Rubber: B. F. Goodrich, Canada, Ltd., will build a \$3.5-million geon polyvinyl plant in Thorold Township (near Niagara Falls), Ont. Neither capacity nor estimated date of completion has as yet been released.

Asphalt: Texas Asphalt and Refining Co. (Houston) will build a \$1-million asphalt plant at Pasadena, Calif. Estimated date of completion: June '56.

Bleached Sulfate Pulp: B. C. Forest Products, Ltd., will increase the capacity of its proposed bleached sulfate



APPENDIX A

STUDIES OF RELIGIOUS AND N.A.M. BELIEF AND COMMITMENT

RESEARCH AND INVESTIGATION IN THE COURSE AND IN THE SCIENCE

(The questionnaire must be sent to: Approximately 1000 to 1500 per cent of the total sample)

	Percent of Total Sample	
	Yes	No
A. Do you believe in a world with a natural and moral dimension of its social life? (yes/no?)	yes	no
	100	100
B. Do you believe in a world with a natural and moral dimension of its social life? (yes/no?)	yes	no
	100	100
C. Do you believe in a world with a natural and moral dimension of its social life? (yes/no?)	yes	no
	100	100
D. Do you believe in a world with a natural and moral dimension of its social life? (yes/no?)	yes	no
	100	100
E. Do you believe in a world with a natural and moral dimension of its social life? (yes/no?)	yes	no
	100	100
F. Do you believe in a world with a natural and moral dimension of its social life? (yes/no?)	yes	no
	100	100
G. Do you believe in a world with a natural and moral dimension of its social life? (yes/no?)	yes	no
	100	100
H. Do you believe in a world with a natural and moral dimension of its social life? (yes/no?)	yes	no
	100	100
I. Do you believe in a world with a natural and moral dimension of its social life? (yes/no?)	yes	no
	100	100
J. Do you believe in a world with a natural and moral dimension of its social life? (yes/no?)	yes	no
	100	100
K. Do you believe in a world with a natural and moral dimension of its social life? (yes/no?)	yes	no
	100	100
L. Do you believe in a world with a natural and moral dimension of its social life? (yes/no?)	yes	no
	100	100
M. Do you believe in a world with a natural and moral dimension of its social life? (yes/no?)	yes	no
	100	100
N. Do you believe in a world with a natural and moral dimension of its social life? (yes/no?)	yes	no
	100	100
O. Do you believe in a world with a natural and moral dimension of its social life? (yes/no?)	yes	no
	100	100
P. Do you believe in a world with a natural and moral dimension of its social life? (yes/no?)	yes	no
	100	100
Q. Do you believe in a world with a natural and moral dimension of its social life? (yes/no?)	yes	no
	100	100
R. Do you believe in a world with a natural and moral dimension of its social life? (yes/no?)	yes	no
	100	100
S. Do you believe in a world with a natural and moral dimension of its social life? (yes/no?)	yes	no
	100	100
T. Do you believe in a world with a natural and moral dimension of its social life? (yes/no?)	yes	no
	100	100
U. Do you believe in a world with a natural and moral dimension of its social life? (yes/no?)	yes	no
	100	100
V. Do you believe in a world with a natural and moral dimension of its social life? (yes/no?)	yes	no
	100	100
W. Do you believe in a world with a natural and moral dimension of its social life? (yes/no?)	yes	no
	100	100
X. Do you believe in a world with a natural and moral dimension of its social life? (yes/no?)	yes	no
	100	100
Y. Do you believe in a world with a natural and moral dimension of its social life? (yes/no?)	yes	no
	100	100
Z. Do you believe in a world with a natural and moral dimension of its social life? (yes/no?)	yes	no
	100	100

Means to Add Manpower

ANOTHER BOOKLET aimed at solving the technical manpower-teacher shortage problem will make its debut this week.

Its sponsor: the National Assn. of Manufacturers.

Titled "Tomorrow's Scientists and Engineers," the guide suggests

concrete means by which companies—large and small—can seek to aid teachers, students and schools in their own plant communities.

Pointers are culled from a recent NAM nationwide survey; distribution will be made, free of charge, to interested firms.

Washington Angles »

» **The Securities & Exchange Commission** sees a seasonal flattening out of capital spending by the chemical process industries during the first quarter of 1956, but the spending level will still be sharply above the level in the first three months of 1955.

For chemicals, petroleum and coal, and paper and rubber companies, the aggregate capital spending forecast for the coming quarter is \$1.163 billion, compared with \$1.3 billion in the quarter now ending. The important comparison, however, is that the same industries laid out only \$843 million for new plants and equipment in the first quarter of '55.

By industry groups, SEC gives these indicated expenditures for the final quarter, 1955, and the first quarter, 1956 (in millions of dollars): paper and allied products, \$166 and \$133; chemical and allied products, \$300 and \$294; petroleum and coal, \$795 and \$697; rubber products, \$44 and \$39.

» **A chemical expert, Lowell Kilgore**, deputy director of BDSA's Chemical and Rubber Division, will be one of the five U.S. tariff negotiators at the forthcoming GATT tariff-cutting session at Geneva.

» **A new compromise chemicals-in-food bill** under study this week may prove to be a middle ground between the licensing and injunction types

of regulation so far suggested as means by which the Food & Drug Administration can supervise introduction of new chemical food additives.

Under the proposal, if FDA feels an additive hasn't been fully tested, it can stop marketing until the maker gets a declaratory judgment from a federal court saying that there has been enough testing to show a material safe for intended use.

» **Radiation sterilization of drugs** has taken a setback at the hands of FDA. The agency now rules that companies using such a process must go through full new-drug clearance on products, rather than just amending original applications.

"The paperwork will cost industry half a million dollars, at least," moans one Washington drug expert.

» **Cyclamate sweeteners got a plug** from the National Research Council's Food & Nutrition Board, which last year viewed their unrestricted use with alarm.

Now the board declares that such use is "without hazard to health," advises further study on the question.

» **Chemical futures . . .** Look for a 10% cut in Defense Dept. chemical buying next year . . . Tariff Commission will hear charges of injury to Domestic montan wax industry at a hearing Jan. 10.

pulp mill at Crofton, on Vancouver Island. Latest plans call for a \$36-million plant with a daily rated capacity of 425 tons of pulp. Construction starts early in 1956.

• **Pulp and Paper:** Alaska Pine & Cellulose Ltd. (Vancouver, B. C.) will expand its pulp- and papermaking facilities at Port Alice at a cost of \$6 million.

The expansion will double the plant's current manufacturing capacity.

• **Titanium Sponge:** Construction of Union Carbide's titanium sponge plant at Ashtabula is progressing on schedule.

When completed (sometime in the third quarter of 1956), the plant will turn out 7,500 tons/year.

• **Cement:** Marquette Cement Manufacturing Co. will expand its cement making facilities at Cape Girardeau, Mo., at a cost of \$7 million.

Capacity of the new unit: 1.25 mil-

lion bbls. annually, raising the company's total capacity at Cape Girardeau to 3 million bbls./year.

• **Cement:** Republic Cement Corp. will build a \$6.5-million plant at Drake, Ariz. Capacity: 2,500 bbls. of gray cement and 750 bbls. of white cement daily.

COMPANIES. . . .

• **Mineral Aggregates Corp.** was formed earlier this month by a group of Denver, Colo., businessmen to process and market a mineral ore as a soluble soil supplement.

The firm has leased a hammer mill at Salida, Colo., to pulverize the ore (containing 37% sulfate, 26% calcium, and smaller percentages of magnesium, potassium, phosphorus, sulfur and nitrogen), expects to be on the market in about 60 days.

• **Uranium mining companies** are bringing real pressure to bear upon the Atomic Energy Commission for

a statement of policy (by spring, preferably) regarding its intentions to buy ore beyond 1962.

Basic reason: in order to put contemplated expansion programs into operation, the companies claim they must know whether the AEC plans to guarantee minimum prices and a schedule of bonuses past 1962.

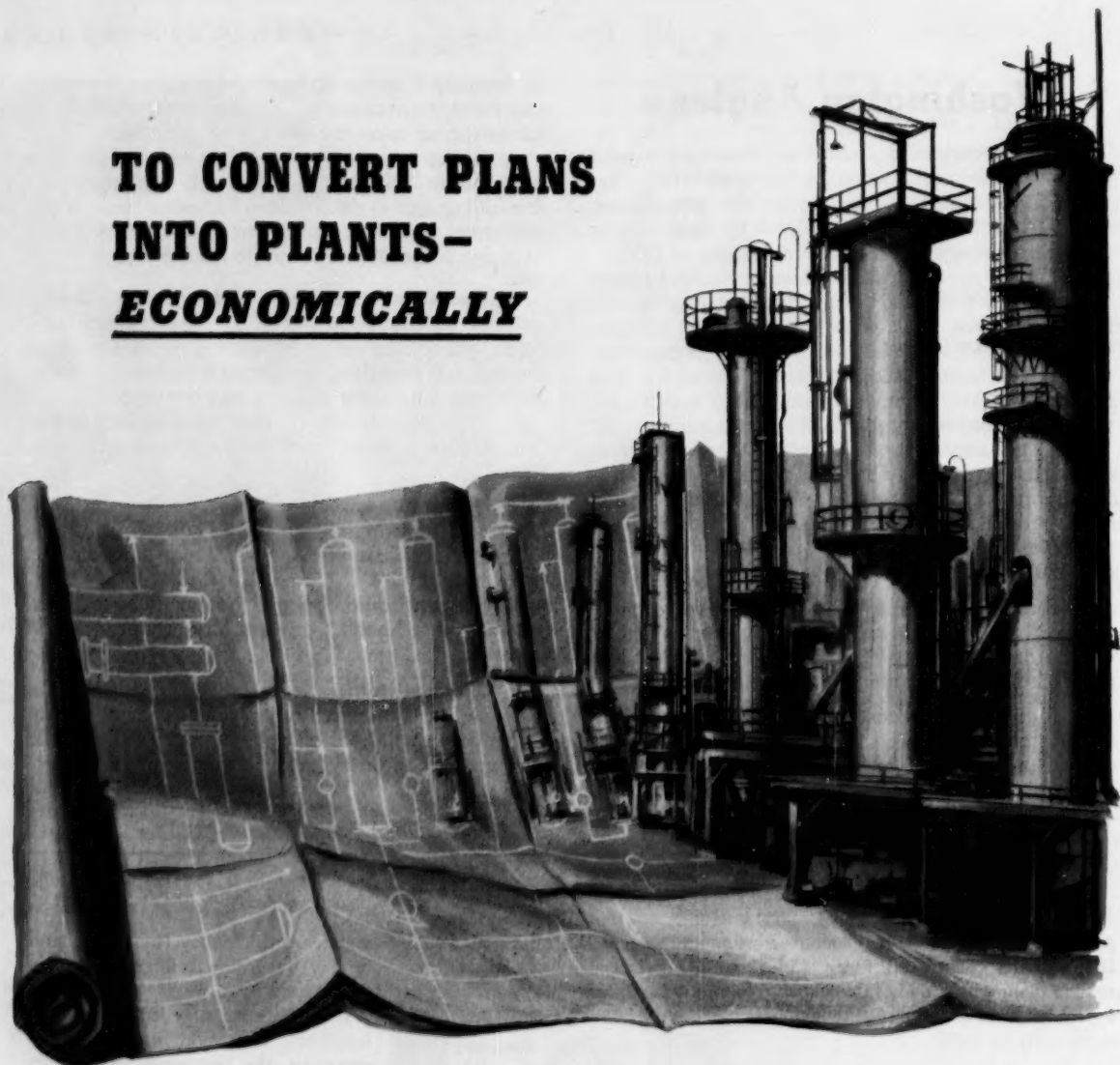
• **Capital stock** of American Resinous Chemicals Corp. (Peabody, Mass.) and of Reslac Chemicals, Inc. (Chicago) has been acquired by the Borden Co.

Reason for both acquisitions, according to Borden's officials, is to attempt to diversify its operations in thermoplastics.

• **Merger** of United Dye & Chemical Corp. and Handridge Oil Co. (Denver, Colo.) has been approved by the directors of both companies.

The proposition (accompanied by a plan of recapitalization) will now be submitted to stockholders for approval.

TO CONVERT PLANS INTO PLANTS— ECONOMICALLY



- Deal with an organization which knows that processing time lost can be counted as dollars wasted.
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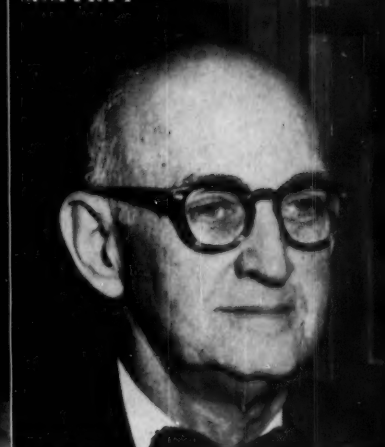
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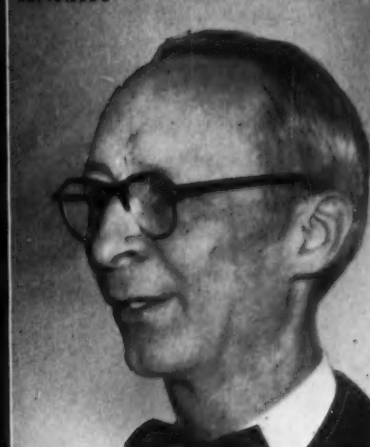
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Unity . . . by Easy Stages

If winter comes, a poet once asked, can spring be far behind? And an equally pertinent question is pending this week for industrial relations people in chemical process companies: Since AFL and CIO have merged at last, can merger of Oil, Chemical & Atomic Workers (of the CIO side) with International Chemical Workers (lately of the AFL) be far behind?

The answer is that these two unions—as of now—are willing to join together; they have a green light from the new federation to unite if they want to; and they have started out on a course that seems likely to lead them by easy stages into a merger by about 1957.

As AFL-CIO unification details were ironed out in last week's 1,400-

delegate convention in a National Guard armory in New York City, these were the prospects for gradual blending of the two chemical unions into a single organization with approximately 300,000 members:

- ICWU and OCAW will both be affiliated with AFL-CIO's Industrial Union Dept., which is headed by ex-CIO President Walter Reuther—the man who put all his prestige behind the merger of CIO's Oil Workers and Chemical Workers last March.

- ICWU and OCAW company councils and industry councils will be working together ever more closely, finding that cooperation is mutually advantageous—as the two unions have already discovered in negotiations with Monsanto and Colgate-Palmolive.

- The committees now being set up by ICWU and OCAW to look into the question of a merger will hold their first joint meeting early in February; and hence these committees may have a definite merger proposal ready to submit to the OCAW convention next August and to the ICWU convention next October.

Cooperation Planned: Meanwhile, these two unions plan to get along very harmoniously under an informal friendship-and-cooperation treaty that has come into being through contacts between ICWU and OCAW staff members.

The era of good relations between these two unions—formerly bitter rivals—started with the signing of the AFL-CIO "no raiding" agreement last year. Amity increased through joint wage bargaining with Colgate last spring and through joint pension ne-

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gotiations with Monsanto this fall; and also through a friendly agreement that OCAW would have priority in organizing one plant and ICWU would have a clear field at another plant in the same locality.

Only official contact between the two unions came last August while ICWU was holding its annual convention. The OCAW executive board wired a suggestion for "discussions regarding the degree of unity that may be achieved" between the two groups; and ICWU replied that it was always willing to talk about a merger that might result in "better standards of living" for "people working in our respective jurisdictions."

OCAW Taking Lead: Since then, the unions have been setting up their merger committees—20 members on the ICWU side, 22 for OCAW—and putting their own internal affairs in order. This has included organizing a number of company and industry councils to coordinate bargaining for various locals.

While OCAW has taken the initiative in merger matters, its officers have made it clear that they're not overly impatient. OCAW is still busy consolidating the merger of its two predecessor unions earlier this year, and is in no great rush to further complicate this process.

Organizing Drive Foreseen: If both unions are members of the AFL-CIO's Industrial Union Dept., their organizing ventures are sure to be synchronized from above so that there's no conflict between OCAW and ICWU in campaigning for representation at any given plant. And it's regarded as certain that IUD will try to put lots of steam into an organizing drive within the chemical industry. Reuther has publicly stated that he means business on this point.

Thus these two unions—which have been at each other's throats most of the time between the first broad-scale chemical organizing under James Nelson until current leaders Edward Moffett of ICWU and O. A. Knight of OCAW took over the reins—now are gently gravitating together. For chemical management, this will mean bargaining with a larger, stronger, and possibly more militant union than ever before—a union that probably will be putting ever more emphasis on company-wide and industry-wide negotiating.



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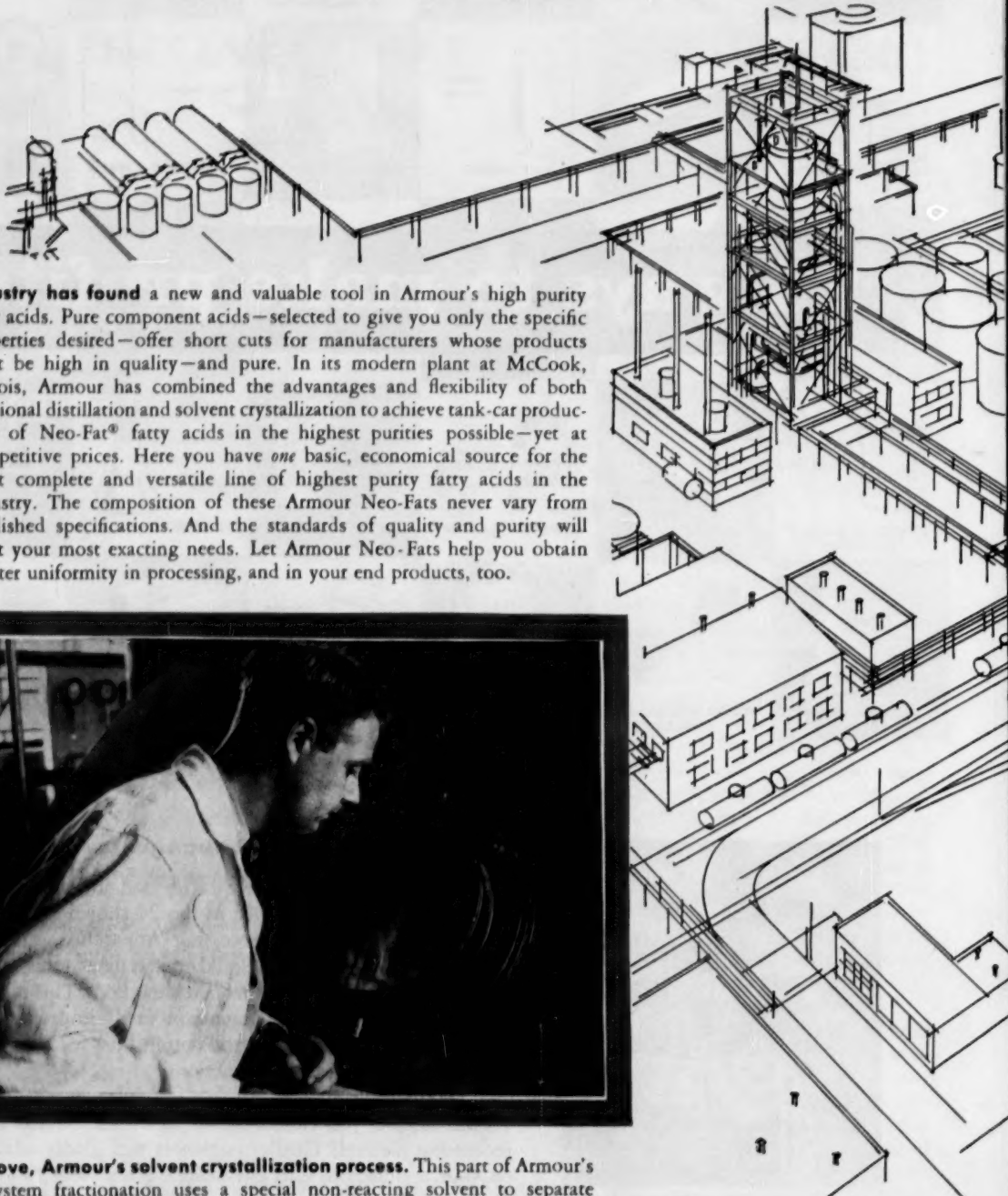
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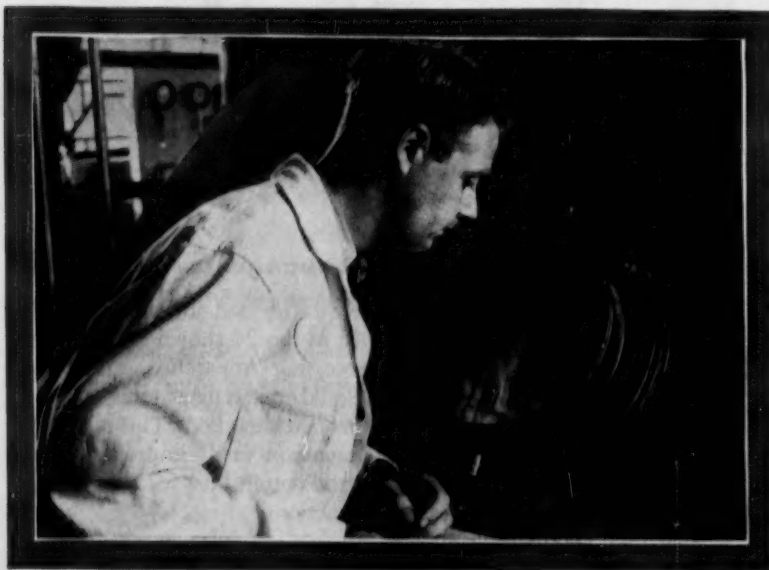
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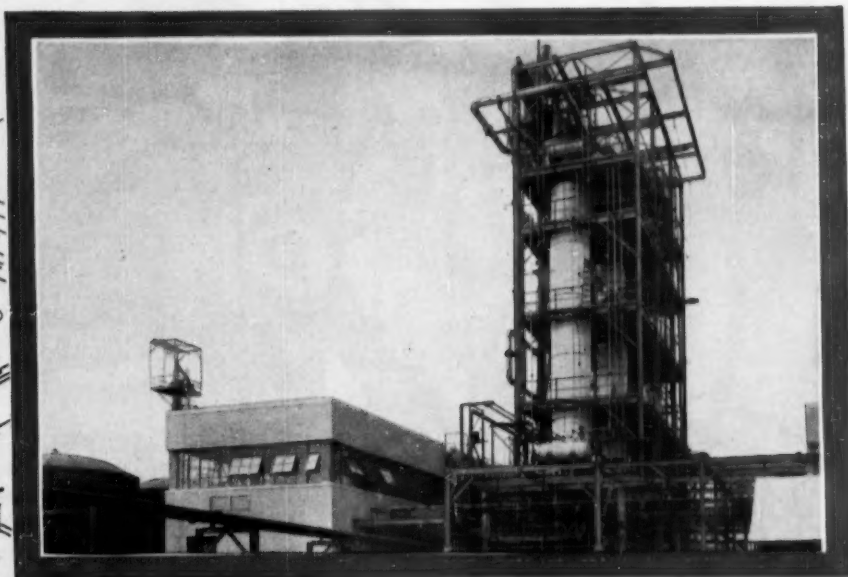
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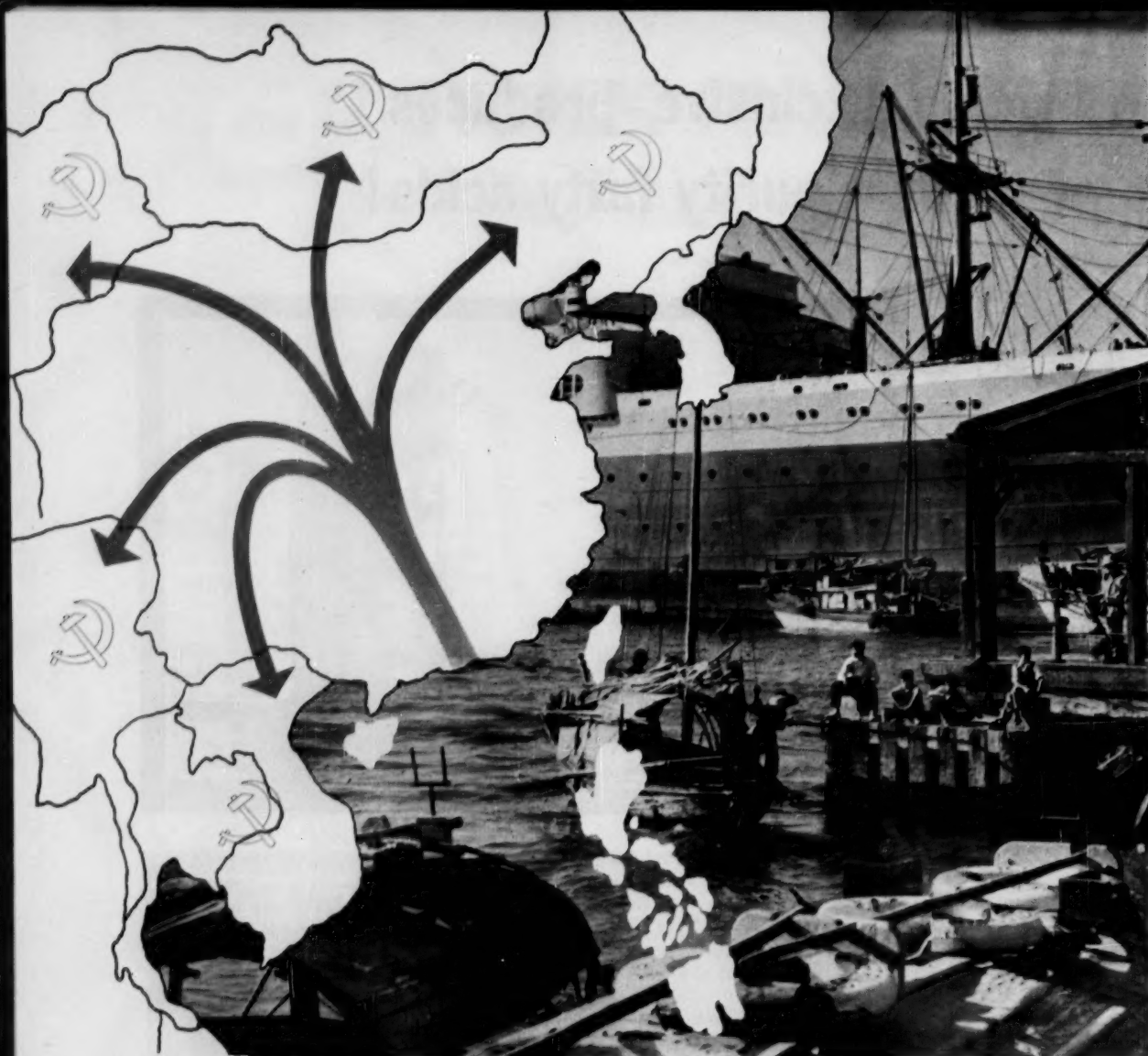
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Slipping Out of Contention

Hong Kong—the famed British crown colony lying at the mouth of the Canton River—is gradually losing its place as commercial gateway between the East and West. U.S. efforts to cut shipments through the island of materials essential to war uses have been so successful that today Hong Kong imports of chemicals have slipped to below \$40 million/year—a 44.5% dip from imports in 1952.

Value of exports of chemicals from Hong Kong has likewise slumped noticeably over the past three years. Whereas in 1952 \$83.8 million in chemicals left Hong Kong docks for

shipment to southeast Asia, this year's total is something nearer \$50 million. And a spot check of exporters' contracts for 1956 suggests that the drop-off may be considerably greater in 1956.

Backed by U.S.: Basic responsibility for the fall-off in shipments through Hong Kong is ascribed to the U.S.—and its efforts to restrict the flow of materials essential to the support of a war effort on the part of Communist China.*

Reciprocating, the importing na-

*A U.N. resolution of May 18, 1951, backed by the U.S., urged an embargo on all military or strategic items.

tions of southeast Asia (Indonesia, Thailand, Malaya, Vietnam, etc.) clamped stringent import restrictions on Hong Kong during 1953-54—thereby shutting off the flow of chemicals from both ends of the funnel.

Natural reaction to this double seal on trade has been a rising tide of ill feeling toward the U.S.—generally regarded by Hong Kong shippers as the cause of the port's steady decline in importance to East-West trade.

It's pointed out, for example, that the U.S. was willing enough to make an exception in its embargo policy when it needed tung oil from China. And similarly—that the U.S. shrugged off Japan's trade with China as an economic necessity at the same time

as it chose to regard Hong Kong trade with China as treason.

Worth the Price? In the face of such outspoken criticism, U.S. policy makers have found it incumbent upon themselves to question the result of their efforts. Was it worth the price? Has the U.S. actually succeeded (through sealing off Hong Kong) in cutting the flow of free-world produced chemicals to China?

Answer to this pointed question (in the minds of observers behind the Bamboo Curtain) is an unequivocal "no."

As Hong Kong has declined as a source of supply, Communist-controlled nations of the Far East have gradually located new sources of materials—mainly in Europe.

A prime example of what's happened: British exports in chemicals and allied products to Red China have increased significantly since 1952. In ever-increasing values, all types of chemicals—from fertilizers and industrial chemicals to pharmaceuticals and specialty products—are moving directly from British ports to Red Chinese ports, bypassing Hong Kong completely.

And the same thing is happening in all other western European nations—with the sole exception of France.

Therefore, although Hong Kong has suffered heavily as a result of the U.S.-endorsed embargoes, Red China—the country against whom the policies were aimed—has suffered little.

Instead, the Communists, led by Chor En-lai, have simply skirted past one step in the procurement of materials. And where Chinese ports were unable to receive the goods, they have turned the direction of trade inland—toward Russia.

What Now? In view of the obvious loopholes in its attempted block of trade with Red China, what can the United Nations do now to patch up the leaks?

Again the answer is (in the opinion of students of Far Eastern trade problems): virtually nothing that would really be effective.

As long as the current system of checking trade records is in force, it is almost impossible to check the ultimate destination of goods.

Moreover, in the Far East (and especially in the case of Hong Kong), smuggling is impossible to control.

And even statistics of export-im-

Here's how chemical shipments are pouring through Hong Kong:

(in millions of dollars)

	Exports		Imports		
	1952	1953	1952	1953	1954
Inorganic	\$20.2	\$3.1	\$19.7	\$3.5	\$2.9
Organic	4.0	3.2	3.5	4.7	5.7
Tars, mineral oils, etc.	-	-	-	-	0.03
Coal-tar dyes	11.3	15.7	7.3	14.8	9.7
Dye tanning agents	0.7	1.2	0.7	0.7	-
Paints, etc.	3.4	4.3	2.7	3.5	2.8
Drugs, etc.	34.8	42.9	26.0	39.0	9.0
Essential oils	1.8	2.7	1.7	3.3	0.4
Soap, cosmetics	1.4	1.4	2.7	3.4	2.8
Fertilizers	0.5	9.6	-	7.7	11.5
Explosives	1.2	1.8	1.2	1.7	-
Chemicals (all others)	4.5	3.4	6.3	6.2	6.2
TOTAL	\$83.8	\$89.4	\$71.7	\$88.5	\$51.0

Here's how Red China trade rose before the embargo:

(in thousands of pounds)

	1948	1949	1950	1951
Exports to Red China	17.5	45.3	91.7	46.9
Total exports through Hong Kong	73.2	154.7	234.8	223.3
Red China as a percent of total trade	24.0	29.3	39.0	21.0

port transactions—arduously compiled—can be sadly misleading unless they show clearly the original country of manufacture. (Trade statistics for Hong Kong, for example, often list an intermediary port of transshipment as the country of origin. And it requires tedious back-checking to determine where the goods were actually manufactured.)

Should the U.S. (in the light of the obvious inadequacies of its attempted embargo system) strive to maintain the facade any longer?

That's a question that is sure to

come up again when the second session of the 84th Congress convenes in Washington next month.

Many leading spokesmen (in both the Republican and the Democratic parties) now frankly think the time for reassessment of the U.S. government's foreign trade policies is at hand. But they are equally open in their belief that the ideal solution of the problem has yet to be suggested.

"Just as in the case of Hong Kong," states one senator, "plugging up one port of trade merely invites the Communists to seek another."



CHEMICALS ON THE KANAWHA: In '56, pollution agencies will put . . .

Plants Under Scrutiny

This year, the main stress has been on building of municipal sewage treatment plants; but during the year to come, state and regional water pollution control agencies will be shifting their attention to abatement measures at chemical and other industrial plants.

Particularly in Southeastern and South Central states, it appears this week, regulatory officials will be checking into waste disposal systems at chemical process plants. And to a greater extent than ever before, they'll be using scientific analytical methods in continuing efforts to track down how much of what pollutant is coming from each plant.

One thing that's spurring various states and communities along in their drive to reduce water pollution: the desire and need for more industrialization. This was a principal theme in the recent Tennessee Industrial Development Conference at Nashville, where Monsanto's Christian Aall stated that extent of existing pollution will be an increasingly important factor in selection of sites for new plants. "Unless we clean up some of our streams," warned S. Leary Jones of the state health department, "we are going to run short of water. There will be plenty of it, but it will not be suitable for industry or for drinking."

And Now, Radioactivity: For several years now, the eight-state Ohio River Valley Water Sanitation Com-

mission—possibly the largest antipollution agency in the country—has been working in consultation with industry committees. Its seventh annual report—out last week—informs the governors of the member states:

"With the municipal treatment program advancing, our major attention is now being directed toward expediting industrial waste control."

The effect of industrial wastes reaching the Ohio River is receiving detailed scrutiny, says Edward Cleary, the commission's executive director and chief engineer. The commission is utilizing data from 16 monitor stations along the 981-mile stretch of water, and for the past four years, samples of river water have been analyzed twice weekly to determine variations in chemical content. In cooperation with the U.S. Public Health Service, a "radioactivity background" evaluation is to be made at those monitor stations next year.

Chlorides Increasing: The commission recently received an interim report showing that the concentration of chlorides in the Ohio River has been increasing. In response to this information, the commission directed Cleary to draw up proposals for future controls on handling of salt-containing wastes.

Three commission-sponsored committees are looking into various aspects of chemical pollution problems. At the

recommendation of the steel industry committee, American Iron & Steel Institute has made a \$42,000 grant to University of Cincinnati's Kettering Laboratory for work on toxic hazards of chemical trace substances; the oil refining industry committee encouraged support from American Petroleum Institute for coordinated work at Johns Hopkins University; and the chemical industry committee has obtained the backing of American Soap & Glycerine Producers Assn. for research projects at the Universities of California, Illinois and Wisconsin and Massachusetts Institute of Technology on methods of control of detergents in water and sewage treatment plants.

Companies Cooperating: West Virginia's state water commission is going after the city of Nitro and other towns along the Kanawha River, but says it has no immediate plans for cracking down on the many chemical plants on that busy stream. A commission official told *CW* that chemical companies in the Kanawha Valley have adopted a long-range pollution control program coinciding with construction of Charleston's \$7.5-million sewage treatment plant, which is due to be completed in 1958.

"Chemical companies in the Charleston-Nitro area are cooperating with us fully," the commission spokesman said. "Through process changes and other methods, they are speeding up pollution control to a point where industrial wastes will no longer be considered a problem."

Water pollution surveys have been carried out in several Southeastern states, and South Carolina streams have been given various classifications, for which certain standards have been set by law. Similarly, in North Carolina, the State Stream Sanitation Committee has proposed standards of various streams, and has let it be known that these proposals—if adopted—will mean that a number of cities and industrial plants will have to improve their sewage disposal facilities. In the case of each river, a public hearing will be held before the proposed standards become final. Current surveys in Georgia are aimed at spotting violations.

In all pollution-conscious states, just as in West Virginia and along the Ohio River, the word for industry seems to be cooperation in fact-finding, alacrity in correction.

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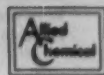
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MONSANTO'S GILLIS: Despite its weaknesses, he argues for . . .

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In a nutshell, that's the long-range planning approach John L. Gillis,* Monsanto vice-president, believes chemical management should be taking right now.

And long-range planning should not be limited to one or two favorite bailiwicks of chemical company operations, either, Gillis says. Instead, forecasting should run the operational gambit—financing, marketing, personnel, production, research, and public relations.

What's more, Gillis contends that a chemical company should spend time and effort in long-range planning, even though it realizes full well that forecasts can be grossly in error. Why?

"Merely putting future plans on paper," he says, "has value. It sharpens the entire organization's knowledge of its present business, and provides new concepts on which to build in the future."

Planning Spurs: There are, he continues, a number of factors that should spur chemical management to consider such long-range planning seriously now. Some of them:

- Chemical competition is toughen-

*Speaking last week at the American Chemical Society's Chemical Marketing and Economics Group (New York) meeting.

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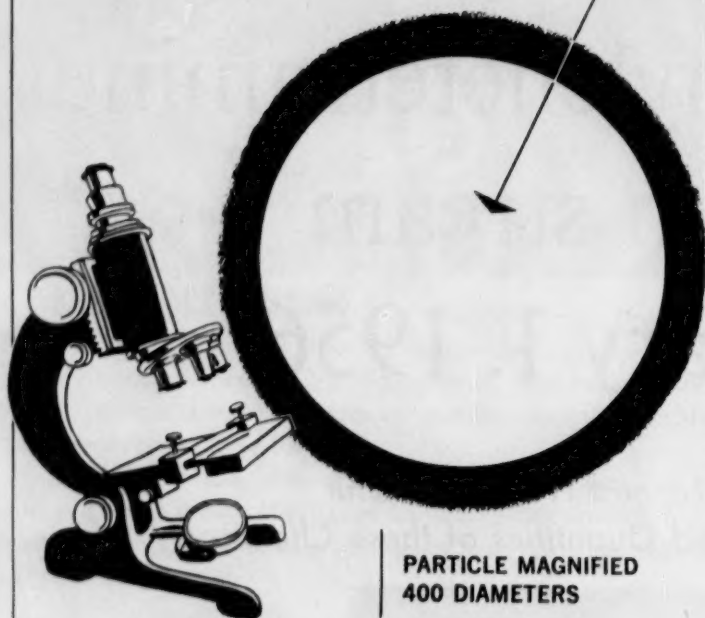


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ing, despite a general upsurge in demand.

- Higher capital investments call for carefully planned future operations.
- Opportunities to jump on high-profit bandwagons are lessening.
- Manpower shortages are here to stay—at least until 1960.

These and other factors preclude "growing like Topsy"; instead, they obviously warrant sharper crystal gazing in all company operations if firms want to improve their competitive positions.

Fostering Planning: What kind of a company atmosphere must prevail to foster such long-range management planning? For one thing, top executives should display a keen appreciation of the value of forecasting.

Furthermore, planning groups must be granted time and facilities to carry out their long-term economic and technological studies. After the studies are completed, forecasters should be encouraged to reduce their prophecies to writing, distribute them throughout the organization (as far as security permits).

Snags To Watch: "But," cautions Gillis, "there are certainly some booby traps to avoid in developing long-range planning programs."

For one thing, companies should adapt their forecast to their own particular problems. "Don't try adopting another company's long-range schemes," Gillis warns.

Next caution: determine the operational areas that are (and aren't) important to the company, and emphasize those of greatest concern.

In addition, companies should carefully select the number of years ahead for which they are planning. "Pick time periods carefully," says Gillis, "depending on individual circumstances."

"Finally," he adds, "don't try to get too fancy, too quickly. Develop approaches to long-range planning slowly, starting first by examining your short-range programs."

End Results: What should be the end results of long-range forecasting, fact gathering, and analysis work? His answer: specific company action programs. Thorough analysis of current (and future) strengths, weaknesses and positions avails a chemical company nothing unless wheels begin turning to correct or strengthen them.

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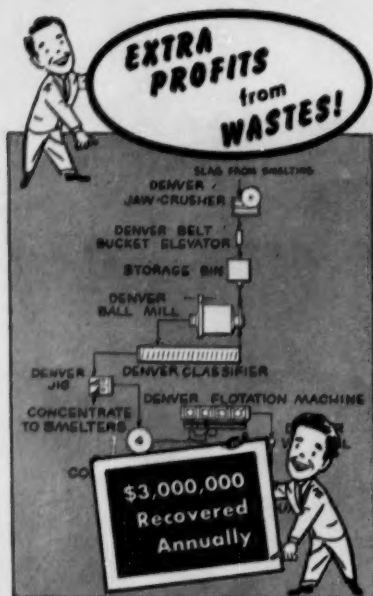
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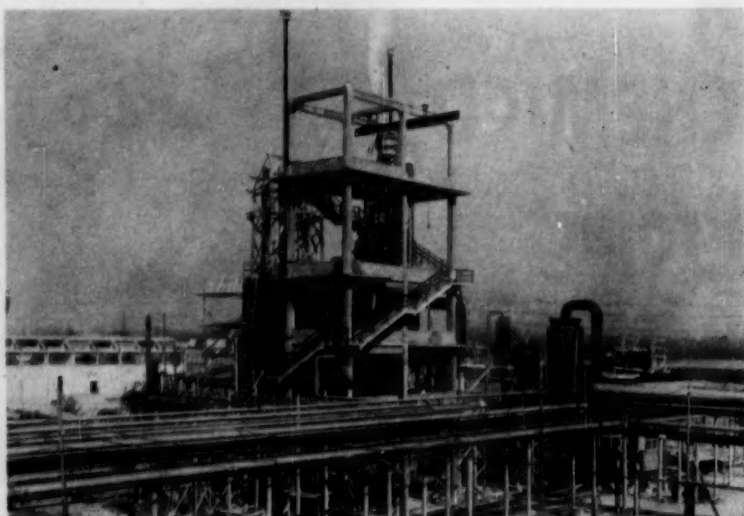
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BUSINESS & INDUSTRY.



AT NOVARA: Montecatini operates one of its six nitrogen fixation plants.

FOREIGN.

Nitrogen Fixation/Italy: Sometimes overlooked in the growth of Montecatini (Milan) is the continuing company emphasis on development of synthetic nitrogen facilities.

By this week, company officials estimate, the firm will have six plants in operation with a total capacity of 208,000 tons/year of primary fixed nitrogen.

Two of the latest big contributors to total capacity: natural gas plants at Ferrara and Novara (*see above*)—which produce 77,000 tons/year.

Salicylic Acid/Mexico: Salicilatos de Mexico, S.A., has just brought on-stream a 30-tons/month salicylic acid plant outside Mexico City.

It was built at a cost of 1.7 million pesos, in partnership with Heyden Chemical Corp. (New York). Output is expected to supply domestic demand of the industrial and pharmaceutical industries, and to provide a new source of export revenue for Mexico.

Plastics/Great Britain: Output of plastics in Great Britain has doubled over the past five years, according to a recent report of the London Board of Trade. Moreover, in the first six months of 1955, total output was nearly 22% higher than in the same period in 1954.

Largest single advance—which alone accounts for well over half of the total

increase—has been registered by Imperial Chemical Industries, Ltd., with polyethylene, and by Bakelite, British Geon, and ICI, with polyvinyl chloride.

And, if present expansion plans are carried out, all major plastics producers will have added to the score within the next few months. For example:

- ICI's output of polyethylene this year will be between 30,000 and 35,000 tons; by 1957, the company expects to raise capacity to 57,000 tons.

- British Geon (a subsidiary of the Distillers' Co.) will bring a new PVC plant on-stream late this month—thereby increasing its yearly capacity of PVC from 15,000 to 27,000 tons.

- ICI's Hillhouse PVC plant now produces between 25,000 and 30,000 tons yearly; plans are currently under way to double this figure by 1957.

Copper Leaching/Israel: With an assist from Dow Chemical Co. (Midland, Mich.), the first stages of construction of a copper leaching plant in Timna started last month.

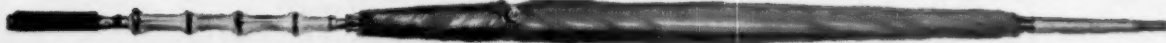
Total investment (handled by Mah-tzevei Israel): \$6.5 million.

The plant, when completed, will use the sulfuric acid leaching process, will turn out a "cement copper" containing 75% metallic copper concentrate—which will then be shipped to Europe for electrolytic refining.

Chief reason for finishing the operation on the Continent: refining, for Israel, is still uneconomical—due to a lack of cheap power.

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(di-iso-octyl phthalate)



D·D·P

(di-decyl phthalate)



D·I·O·A

(di-iso-octyl adipate)



D·D·A

(di-decyl adipate)



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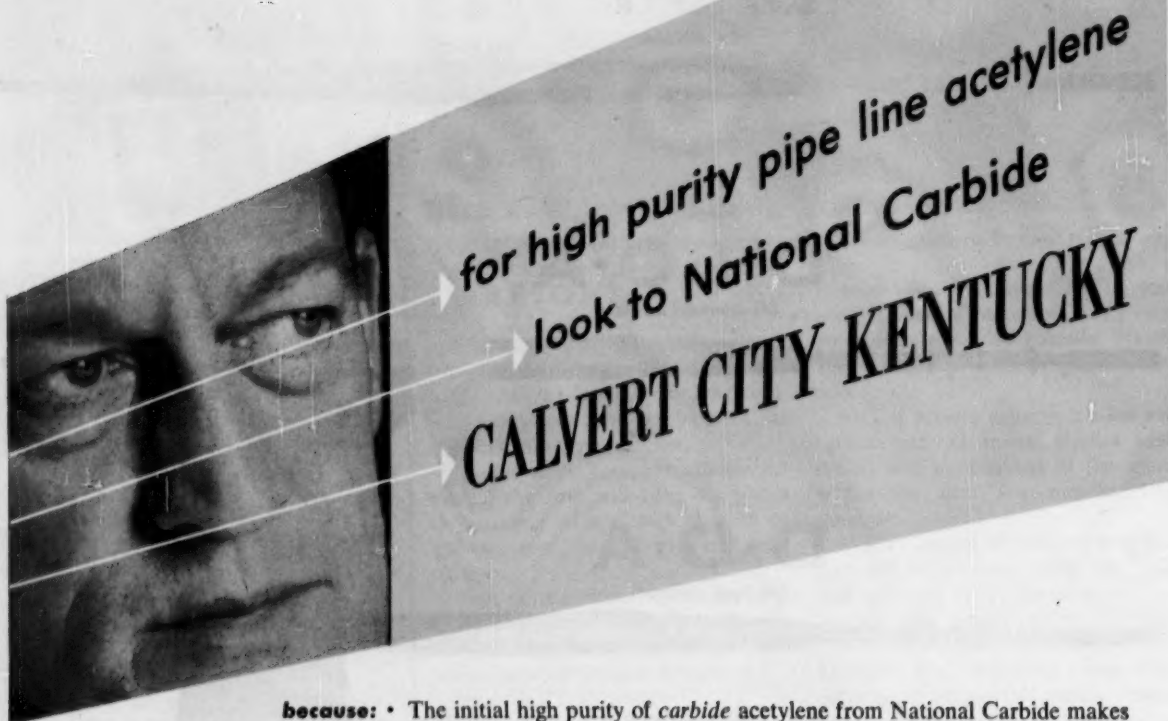
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ENJAY IS THE PIONEER AND THE WORLD'S LARGEST SUPPLIER OF ALCOHOLS BY THE OXO PROCESS

December 17, 1955 • Chemical Week

35

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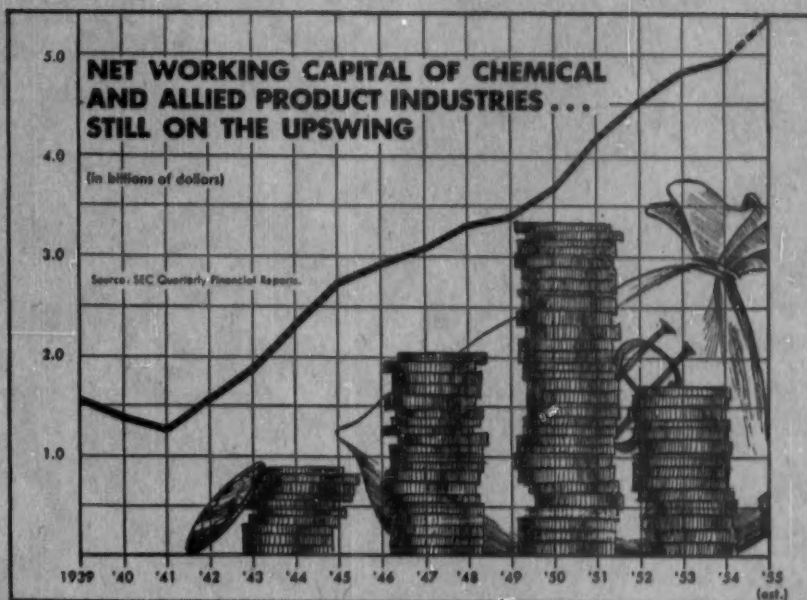
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NATIONAL CARBIDE COMPANY is a division of AIR REDUCTION COMPANY, INCORPORATED • Principal products of other divisions include: AIRCO — industrial gases, welding and cutting equipment and acetylenic chemicals • OHIO — medical gases and hospital equipment • PURECO — carbon dioxide, liquid-solid ("DRY-ICE") • COLTON — polyvinyl acetates, alcohols, and other synthetic resins.

Charting Business

CHEMICAL WEEK
DECEMBER 17, 1955

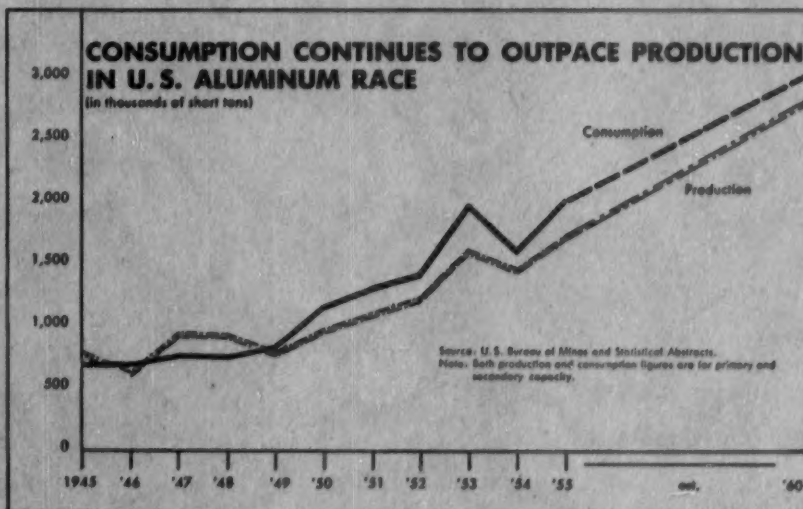


NET WORKING CAPITAL of U.S. chemical companies is still increasing, but the pace may not be fast enough to support the continued fast pace of expansion. Basic reasons, according to one financial vice-president:

- Corporate taxes in recent years have

been so high that most companies have been forced to cut down on retained earnings (see p. 17).

- The race to get new facilities into operation has caused almost all firms to go into debt financing—it's faster than putting out a stock issue.

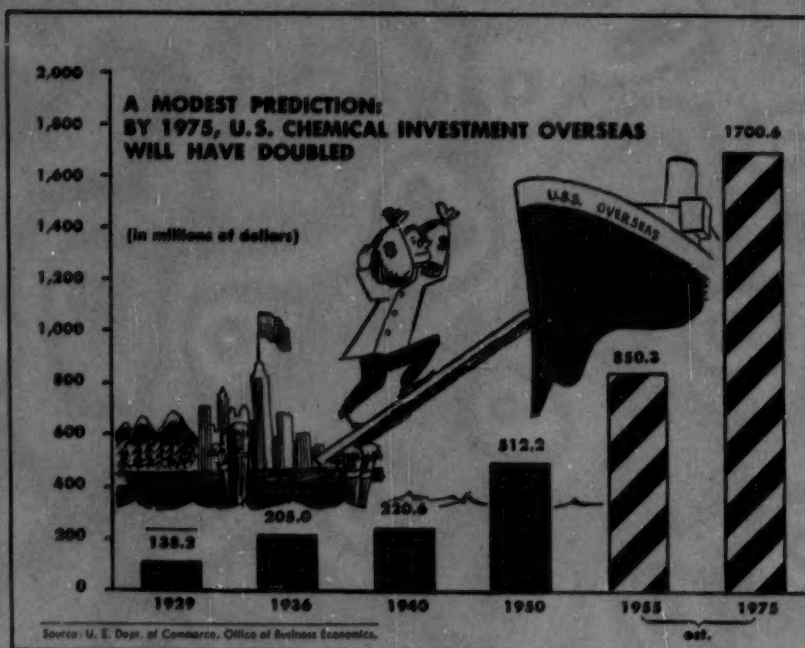


DESPITE expansion moves into basic aluminum production last week by Olin Mathieson Chemical Corp. and Kaiser Aluminum & Chemical Co. (see p. 18), demand may continue to outstrip output—as far ahead as 1965.

Whereas consumption this year is totaling close to 2 million short tons, consumption by 1960 should be 3 million. And by 1965, industry observers are predicting, the market for basic aluminum will be 4 million.

Charting Business

(Continued)



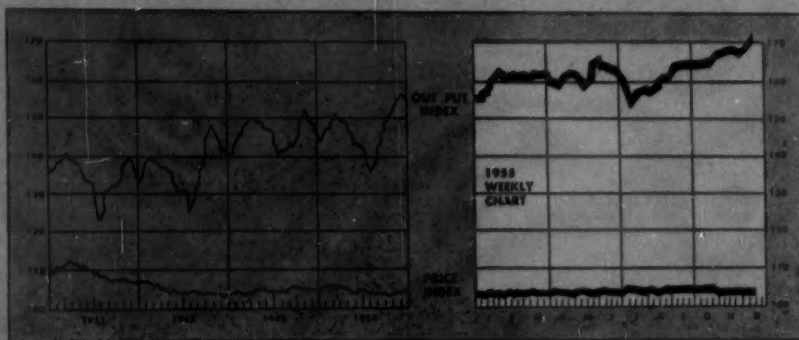
INVESTMENT overseas by U.S. chemical firms will double in the next 20 years, according to latest survey reports.

Three main factors will account for the surge: the desire of U.S. firms already operating abroad to consolidate foreign market positions; the need of companies

not now in overseas production to diversify; and the growing basic raw material requirements of the U.S. chemical industry.

Estimated chemical industry profit return in 1975 from foreign investments: \$1.6 billion.

BUSINESS INDICATORS

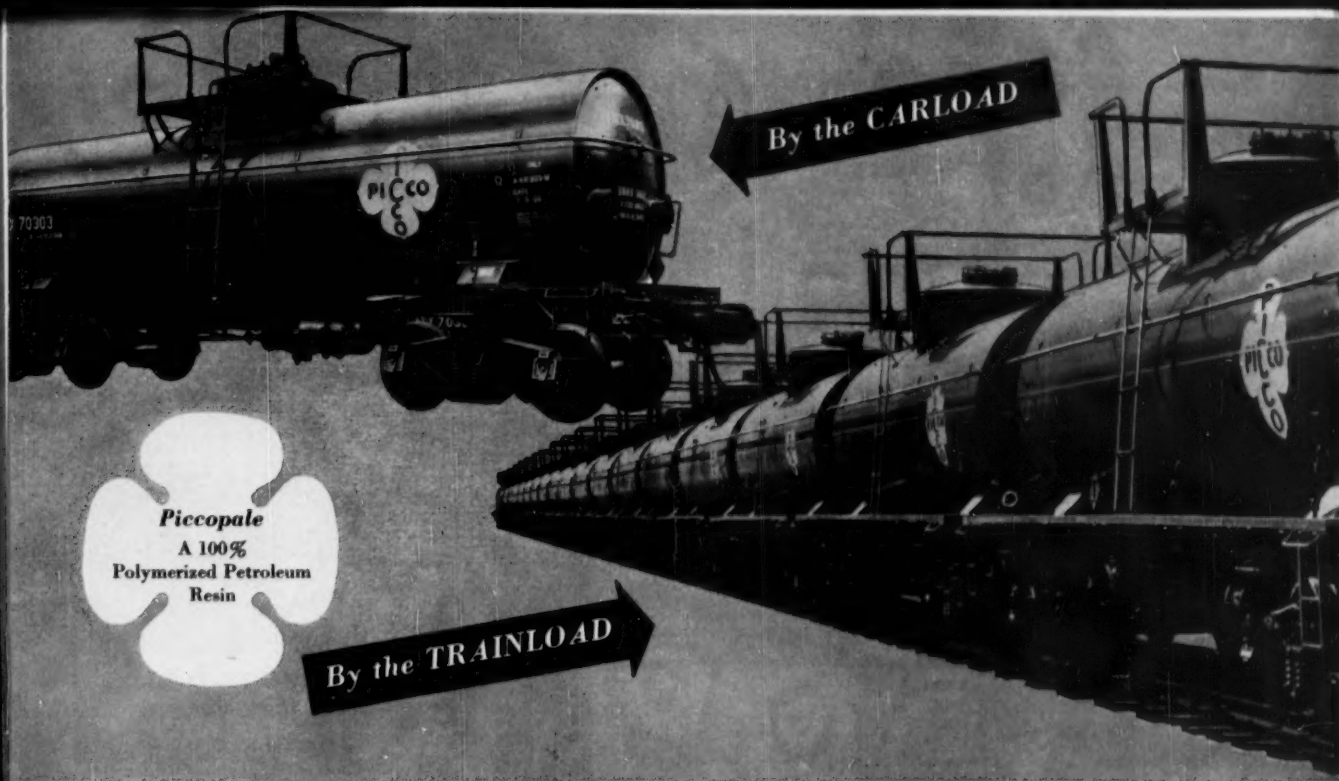


WEEKLY

	Latest Week	Preceding Week	Year Ago
Chemical Week Output Index (1947-49=100)	171.8	171.5	156.0
Chemical Week Wholesale Price Index (1947=100)	104.8	104.7	104.2
Stock Price Index of 11 Chemical Companies (Standard & Poor's Corp.)	479.4	475.1	366.6

MONTHLY INDICATORS—Wholesale Prices (Index 1947-1949=100)

	Latest Month	Preceding Month	Year Ago
All Commodities (other than Farm and Foods)	119.3	119.0	114.8
Chemicals and Allied Products	106.6	106.5	107.0
Industrial Chemicals	119.3	118.9	117.7



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Its esters find application as plasticizers for vinyl and other synthetic resins, as hydraulic oils, synthetic lubricating oils, weed and brush killers, etc. Illustrative properties of typical esters follow:

	Sp. Gr. 20/20°C	Pour Point °C	Viscosity Centistokes 20°C	Temp. (°C) for 1000 Stokes Viscosity
Mono-esters of:				
Octanoic Acid	0.862	-73	5.0	-73
Pelargonic Acid	0.865	-57	5.4	-73
Capric Acid	0.863	-57	6.9	-73
Lauric Acid	0.863	-32	9.5	-73
2, 4-D Acid	1.153	-40	59	-32
Di-esters of:				
Phthalic Anhydride*	0.981	-48	74	-42
Succinic Acid	0.933	-73	16	-64
Maleic Anhydride	0.940	-65	21	-58
Adipic Acid	0.928	-73	18	-70
Tri-ester:				
Phosphate	0.910	-73	17	-58

* "DIOP" is an outstanding all-purpose vinyl plasticizer, now approved for non-toxic applications as in food wrappings.

** "DIOA" and "DIOS" are applicable in vinyl formulations for low temperature applications.

Contact your supplier for samples of these esters. INDOIL Chemical Company does not manufacture esters, but the outstanding esterification quality of INDOIL Isooctyl Alcohol makes it an unexcelled source for these rapidly growing products.

Send for INDOIL Technical Bulletin No. 22 for further data.

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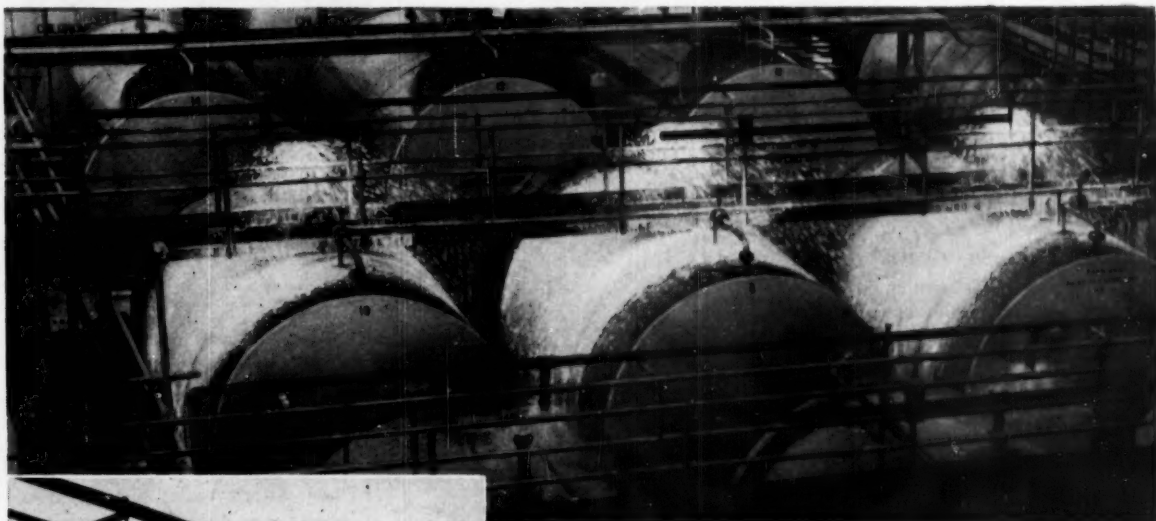
SENATOR O'MAHONEY: In era of mergers, he spotlights 'bigness.'

LEGAL

Point of Departure: For those members of Congress who feel that the wave of mergers that continued through this year warrants revision of the federal antitrust laws, the General Motors hearings being held by Senator Joseph O'Mahoney (D., Wyo.) and his antitrust and monopoly sub-committee will serve as a point of departure. O'Mahoney—lacking funds to carry out a broader investigation on how the Sherman and Clayton Acts are working out—has been concentrating on General Motors as "a study in corporate bigness." He's looking into such subjects as growth, share of the market, diversification into non-automotive lines, marketing practices, and dealer relations. O'Mahoney is an advocate of the proposal that corporations doing business in interstate commerce should be chartered by the federal government and be governed by federal law.

Worldwide Arena: The tetracycline patent dispute continues to thunder along in an international arena this week. Latest development: Pfizer has been granted an injunction against Olin Mathieson's E. R. Squibb & Sons Inter-American Corp. in Cuba. The Cuban court order forbids sale, distribution or use of the antibiotic by Squibb in that country. Pfizer has both a product patent and a process (direct fermentation) patent on tetracycline in Cuba.

FLAMMABLE CHEMICAL STORAGE SAFEGUARDED BY SPECIAL GRINNELL SYSTEM



At the Bridesburg plant of the Rohm & Haas Company, Philadelphia, Pa., protection of stored alcohol and monochlorobenzene is entrusted to a foam system installed by Grinnell. In the event of fire, flame-smothering foam covers the manhole, the most hazardous part of the tank; at the same time building up a foam blanket in the dyked area at base of tanks to kill fire there. (See test operation photos above.)

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Mechanical foam, one of many special Grinnell fire protection systems, is used for fire hazards involving flammable liquids . . . such as in tank storage of chemicals; oil and paint rooms; loading racks; creosote tanks; pump houses; and processing rooms. Mechanical foam operates by shutting off the oxygen from the flammable vapors—and by insulating against the heat of the fire. It is flexible and adaptable; floats on liquids, flows over and around obstacles, clings to solids.

Call on Grinnell for help with your fire protection problems. Grinnell engineers are trained to evaluate your property and to advise on the proper system for your hazard. With a full range of equipment and more than 85 years experience in fire protection work, you are assured of unbiased recommendations which will be fitted to your exact needs. Grinnell Company, Inc., 233 West Exchange Street, Providence, R. I.

There's a GRINNELL Fire Protection System for every fire hazard

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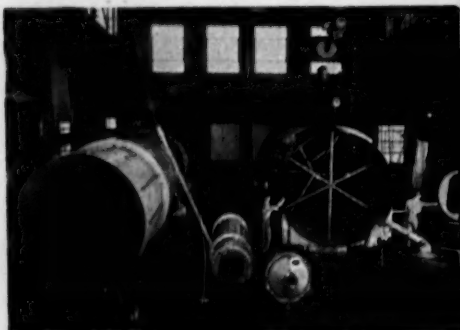
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Davenport Machine & Foundry Company has adequate facilities for fabricating drying equipment from the smallest laboratory units to the largest commercial units.

Three units in the process of fabrication in our plant are pictured above.
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Let our engineers consult with you on your PRESSING, DRYING, and COOLING problems. Send for complete catalog, or for quick reference, consult your CHEMICAL ENGINEERING CATALOG, 1954 or 1955.

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B & I



FLORIDA'S WATSON: After 11 years, his law still sparks fireworks.

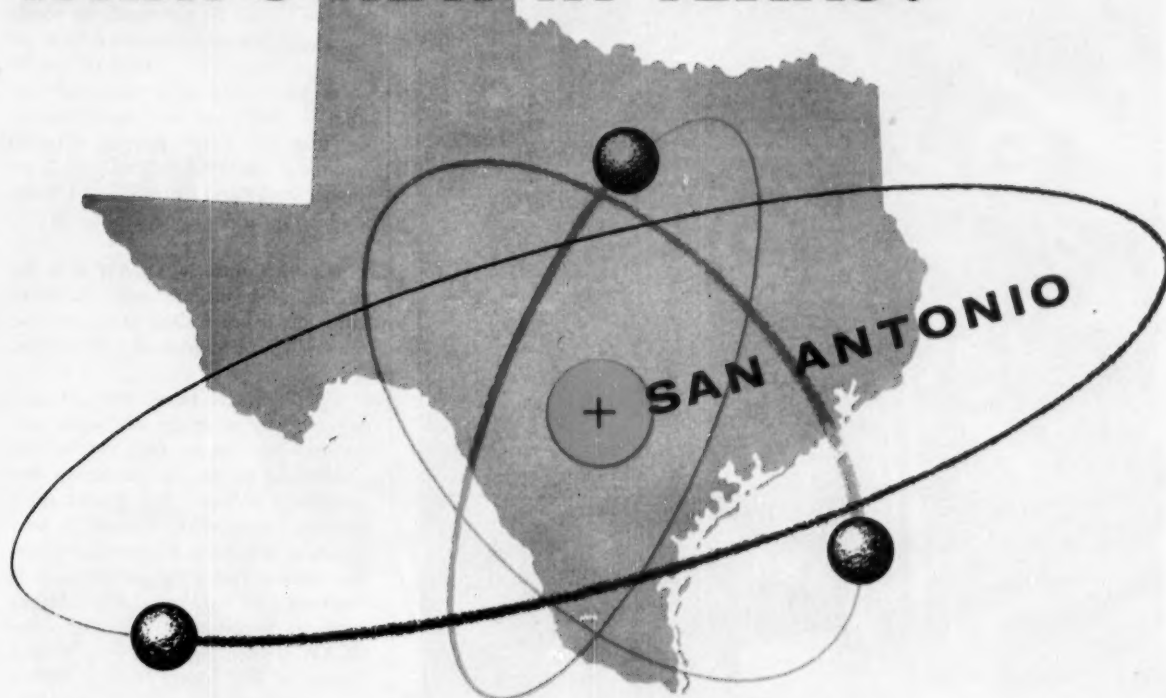
LABOR

Under Attack Again: AFL and CIO membership in Florida has increased steadily during the 11 years since that state became the first to prohibit the union-shop contract. But despite that growth in union rolls, it appears this week that Florida labor groups are getting set to launch a new attack on the so-called "right-to-work" amendment when the state's legislature meets next April in Tallahassee. The ban on union shops—passed in 1944 through the efforts of proponents led by the late J. Tom Watson, aggressive attorney general—has been blasted recently by the state CIO president and criticized less vehemently by the president of the Florida Federation of Labor (AFL).

Ups and Downs: The CIO's Oil, Chemical & Atomic Workers Union has had its moments of triumph and despair lately:

For instance, at the not-yet-completed Cramet titanium plant in Chattanooga, Tenn., OCAW has apparently won bargaining rights for production workers on the payroll now and those to be hired in the future. The plant was picketed last summer because the company and the National Labor Relations Board were reluctant to hold an election until substantially all of the plant's 700 or 750 employees were on the job (*CW*, Sept. 24, p. 32). Nevertheless, the election was held last month, with 286 persons eligible to

WHAT'S NEW IN TEXAS?



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Now under construction in San Antonio, Texas, the new \$6,600,000 plant of American Lithium Chemicals, Incorporated, will help meet Industry's growing demand for lithium products. This new source of supply, an affiliate of American Potash & Chemical Corporation, will process high-grade lithium ores from extensive deposits in Southern Rhodesia. The initial production in San Antonio of lithium hydroxide, added to the present lithium carbonate output at Trona, California, now assures a substantial increase in domestic supply of lithia, used in its various forms in quality glassware, porcelain enamel glazes, lubricating grease, storage batteries, heat treating operations and humidity control. You can take advantage of this major step in American Potash & Chemical's program of expansion in the lithium chemical field by including this new source in your future lithium plans.

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vote; and OCAW got 255 ballots to 18 for "no union."

In a different setting, OCAW is asking NLRB to disregard the results of a decertification election held at the Mt. Vernon, Ind., refinery of the Indiana Farm Bureau. The union charges that the employer used unfair tactics, in that the Farm Bureau allegedly promised the workers that they'd get higher wages and better fringe benefits if they would vote the union out.

Bias in Contracts: OCAW is in the middle of a dispute over the labor contracts between Gulf Oil Corp. and OCAW's local unions in Port Arthur, Tex.

The contracts have been attacked in court by a group of Negro employees who assert that they're discriminated against in the hiring and promotion policies. The district court and the circuit court refused to hear the case; but the U.S. Supreme Court has decided that a federal question is involved, and has ordered the district court at Houston to take the case. OCAW is taking part in the suit as a "friend of the court," having filed a brief in favor of the Negro plaintiffs.

KEY CHANGES. . .

Arthur S. Bland, Jr., to administrative vice-president, and **Gene K. Foss**, to vice-president, sales, Grove Laboratories, Inc. (St. Louis, Mo.).

Albert G. Noble, to vice-president, Vitro Corp. of America (New York).

Wilfred D. Gillen, to director, Atlas Powder Co. (Wilmington, Del.).

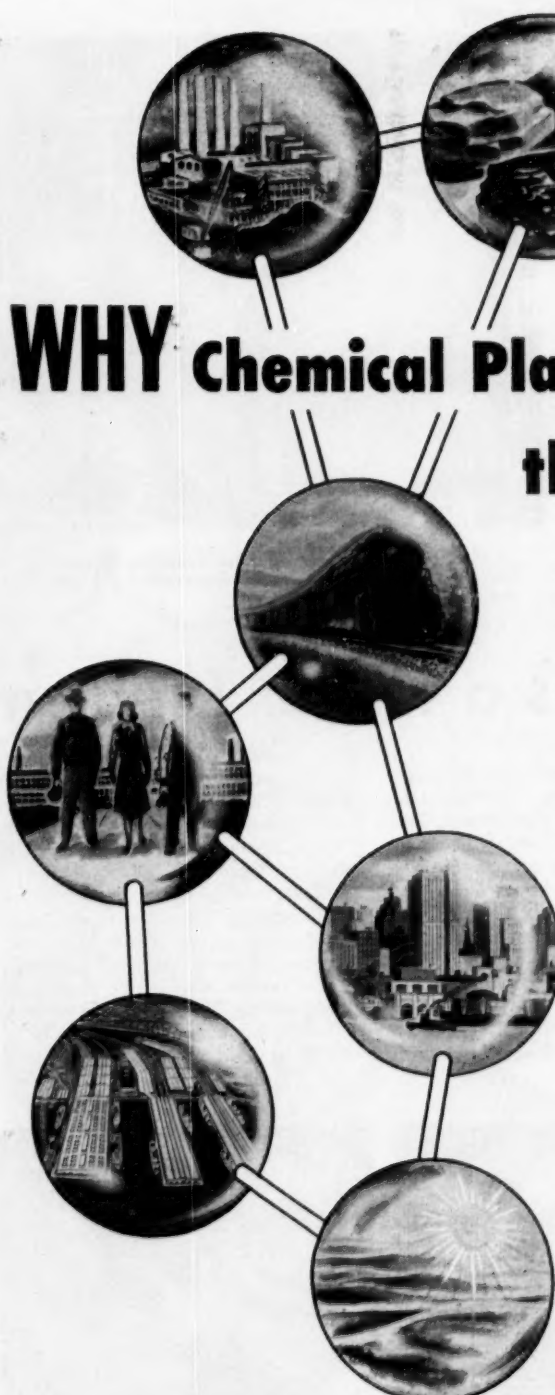
Daniel F. Martine, to industrial relations manager, Chemical Division, General Tire & Rubber Co. (Akron, O.).

Bruce B. Allen, to technical director, Celanese Textile Division, Celanese Corp. of America (Summit, N. J.).

Setrak K. Derderian, to vice-president, Metal Hydrides Inc. (Beverly, Mass.).

Gordon Cook, to general manager, colloidal dispersions, Columbia Carbon Co. (New York).

Willard P. Scott, to vice-president, American Potash & Chemical Corp. (Los Angeles).



WHY Chemical Plants are locating in the *Land of Plenty*

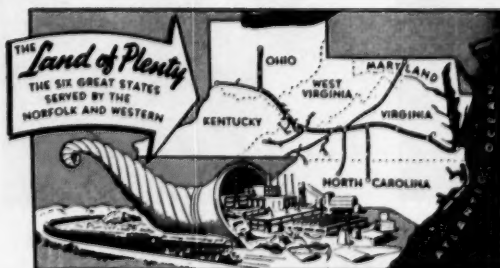
- Excellent Plant Sites With Room For Expansion
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- Abundance Of Dependable Workers
- Near Major Industrial And Consumer Markets Of The East, South And Midwest
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These are the natural and man-made features of the Land of Plenty which are attracting more and more chemical industries to the great six-state territory served by the Norfolk and Western.

Chemical plants of all sizes—whether designed for processing raw materials or making finished products—can look forward to a profitable future in the Land of Plenty. For detailed information or assistance with specific problems, call on N&W's experienced staff of plant location specialists. Inquiries are handled in confidence and without obligation.

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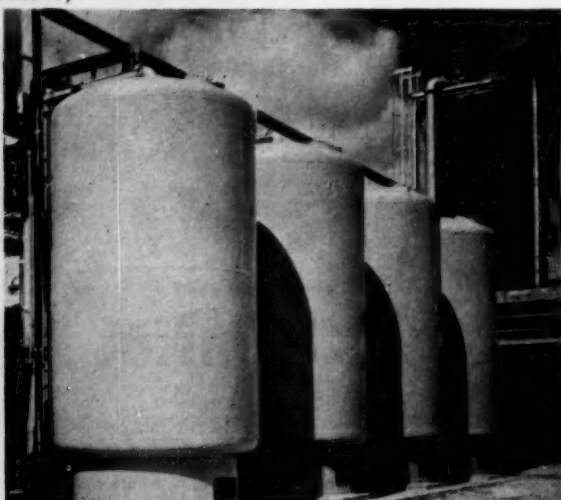
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• **Test runs** — Where required, Permutit checks the installation, supervises start-up and initial operation, trains permanent operating personnel.

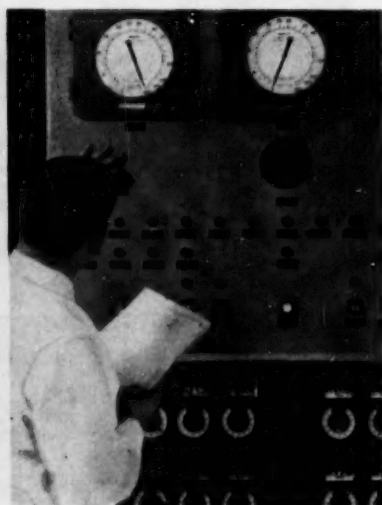
• **For further information** look up the Permutit office in your city or write to The Permutit Company, Dept. CW-12, 330 West 42nd St., New York 36, N. Y.



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Paraffins	Nil
Copper Corrosion	Passes
Sulfur Compounds	Nil
Acidity	Nil
Odor	Mild
Color	Water White
Mixed Aniline Point	11° C
KB Value	98
Distillation IBP	136° C
50%	140° C
Dry Point	144° D

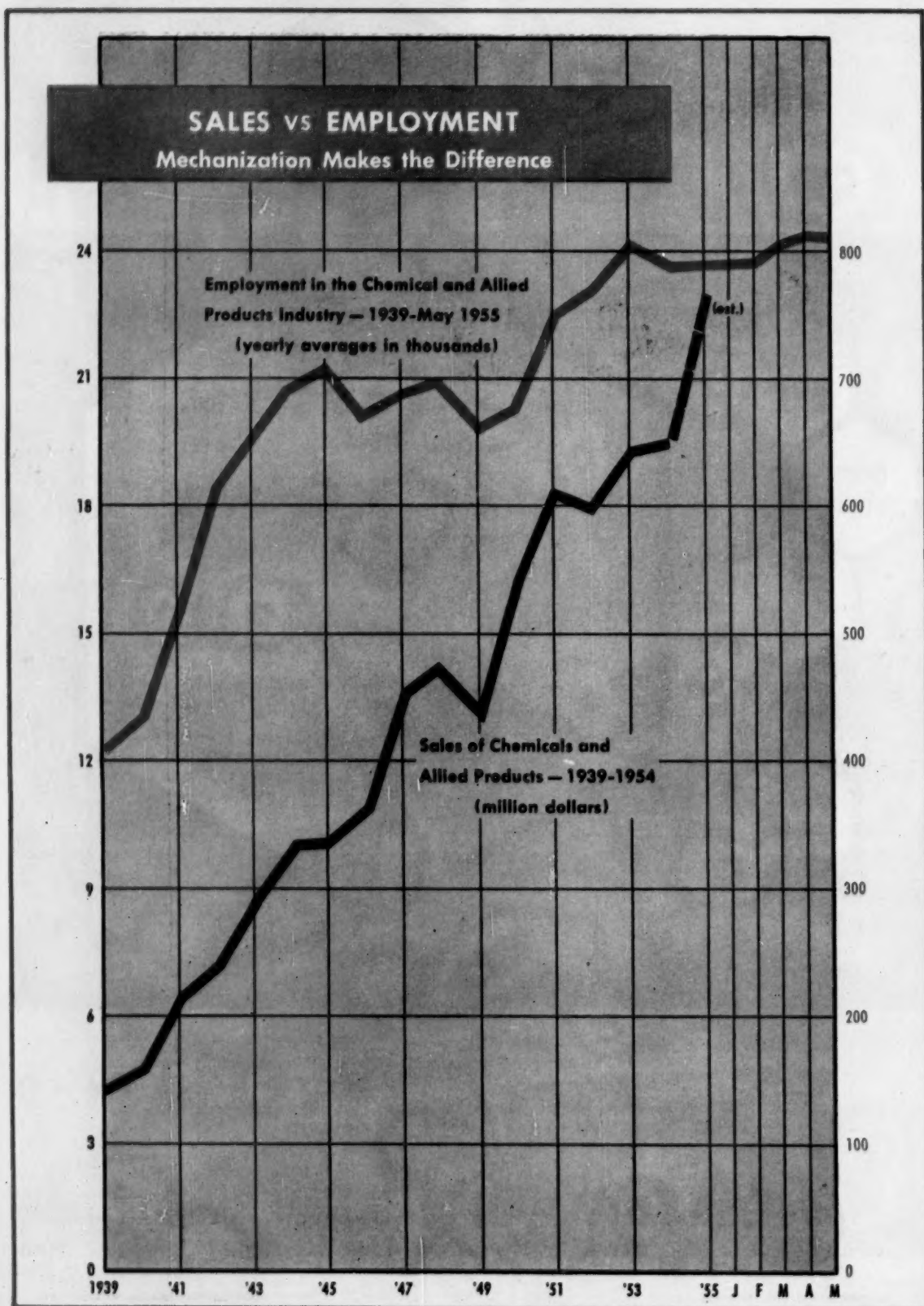
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by Sol Swerdloff

Manpower Shake-up in the Chemical Industry

Recovering lost ground, chemical employment hits 814,000, heads for the million mark.

At the same time, the trend toward automatic control is boosting individual output, putting the emphasis on professional and maintenance personnel, and generally recasting employment make-up and distribution.

Never before has the level of employment in the chemical and allied products industry* risen so high as it has this year. Topping the 814,000 mark in August, this employment

surge is particularly remarkable in view of the industry's roller-coaster ride through World War II, the Korean emergency, and the postwar readjustments.

The increase in chemical employment from mid-1939 to mid-1945 was about twice as high as for all manufacturing industries. Between

mid-1950 and mid-1955, the story was repeated. Today, despite such sharp postwar fall-offs as the one in 1945 (which cut back the number of employees from 751,000 in April to 654,000 in November), chemical employment is more than double what it was in 1939, and shows little sign of easing off. But the industry's labor force did not come through these readjustment periods unscathed. Its size, shape, composition and distribution were all changed.

Before these changes had a chance to gel, the chemical industry came face to face with new developments—automation, expansion, etc.—which

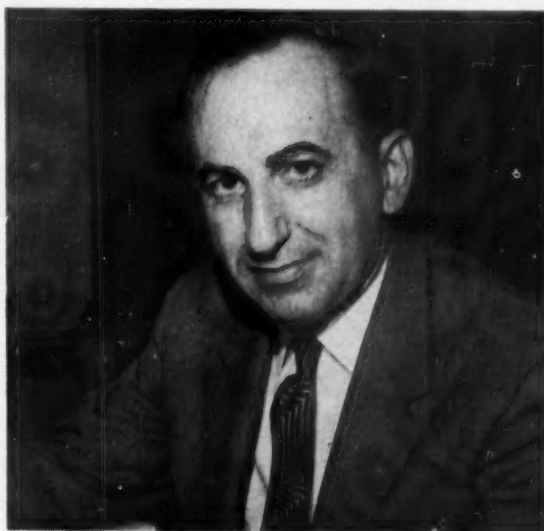
*"Chemicals and allied products" covers Industry Group 28 of the government's Standard Industrial Classification Manual, Bureau of the Budget, Nov. 1945; it includes producers of basic chemicals, intermediates and finished compounds.

Meet the Author

SOL SWERDLOFF is one of the men through whom government gatherers constantly funnel statistics on industrial employment. His job is turning this mass of data into meaningful information.

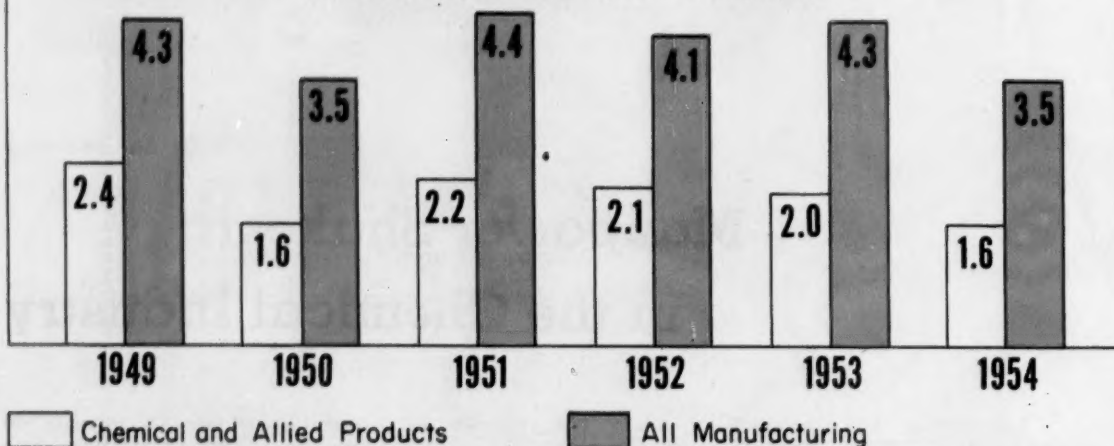
At present, he is chief of section in the Skilled Manpower and Industrial Employment Studies branch of Bureau of Labor Statistics, U.S. Dept. of Labor. He has been with the bureau 11 years. For the past eight years, he has been concerned with reports on employment trends and job opportunities in various industries, has prepared, among other Dept. of Labor bulletins, one on Employment Outlook in the Industrial Chemical Industry. Before this, he made studies of productivity and technological developments in U.S. industry for the department.

A graduate of the University of Wisconsin, Swerdloff obtained his M.A. in economics at The American University, is now studying for his doctorate.



CHEMICAL WORKERS PROVE MORE DURABLE

Monthly Turnover: Total Separation Rates
(Annual average 1949-54 per 100 employees)



Source: U.S. Dept. of Labor, Bureau of Labor Statistics.

C W Report

necessitated additional alternations in its labor force. Today, employment in the chemical industry is still changing, and out of this kaleidoscope are coming the trends of tomorrow. Here is how the picture looks now, how the pattern shapes up for the future, and some of the whys, wherefores and wheretos.

Men vs. Machines: Despite tremendous new capacity built during World War II, the growing postwar markets for chemical products required additional substantial investments in new plants and facilities. From the beginning of 1946 through mid-1955, outlays for new plant and equipment by the chemical industry averaged close to \$1.1 billion/year, adding up to about \$10 billion over the 9½-year period. This represents about 10% of the total expenditures for new plant and equipment for all manufacturing industries. And the long-range outlook is for continued expansion of chemical production facilities.

Employment, however, is not likely to increase at the same rate as production. The industry is noted for its ability to greatly increase its output with a much smaller proportionate rise in the number of its employees.

Dollar sales of chemicals and allied products in '54, for example, were nearly five times the '39 level, whereas '54 employment was less than double the '39 average. Although much of this increase in value of sales can be accounted for by a rise in prices, a considerable portion of the difference in the rate of growth between production and employment reflects a rise in output per employee.*

Despite expected technological progress, the expansion of chemical production will be sufficiently great to create a significant increase in the industry's employment requirements.

But the management's manpower problem won't be one of recruiting new workers; rather, it will be one of increased training for new positions and for retraining some of the older employees. Greater mechanization in chemical plants and the trend towards greater automaticity of operation will mean that the number of processing equipment operators will become a

smaller proportion of total employment. At the same time, the increased dependence on more control and processing equipment will boost the industry's requirements for electricians, pipe fitters, mechanics, and other maintenance workers.

Scientists in Serge: Too, the employment of chemists and engineers will continue to grow at a faster rate than total employment. Chemical companies will have to scramble to recruit scientific personnel both for expansion and for replacement needs. While there is some difference of opinion as to the severity of shortage in these occupations, many companies report a continuing shortage of chemists, chemical engineers and other scientific personnel.

Increasing mechanization and instrumentation and the continuing growth of research are cited as the chief reasons for this growing demand for chemists and chemical engineers. These advances in methods of processing, say management men, have been particularly influential in increasing the need for chemical engineers in design and supervisory work.

In a recent Bureau of Labor Statistics survey,* the growing complexity

*The Federal Reserve Board index of production for chemicals and allied products shows that output increased by about 3½ times between 1939 and '54.

*Demand for Personnel in the Chemical Professions, U.S. Dept. of Labor, Bureau of Labor Statistics, June '54.

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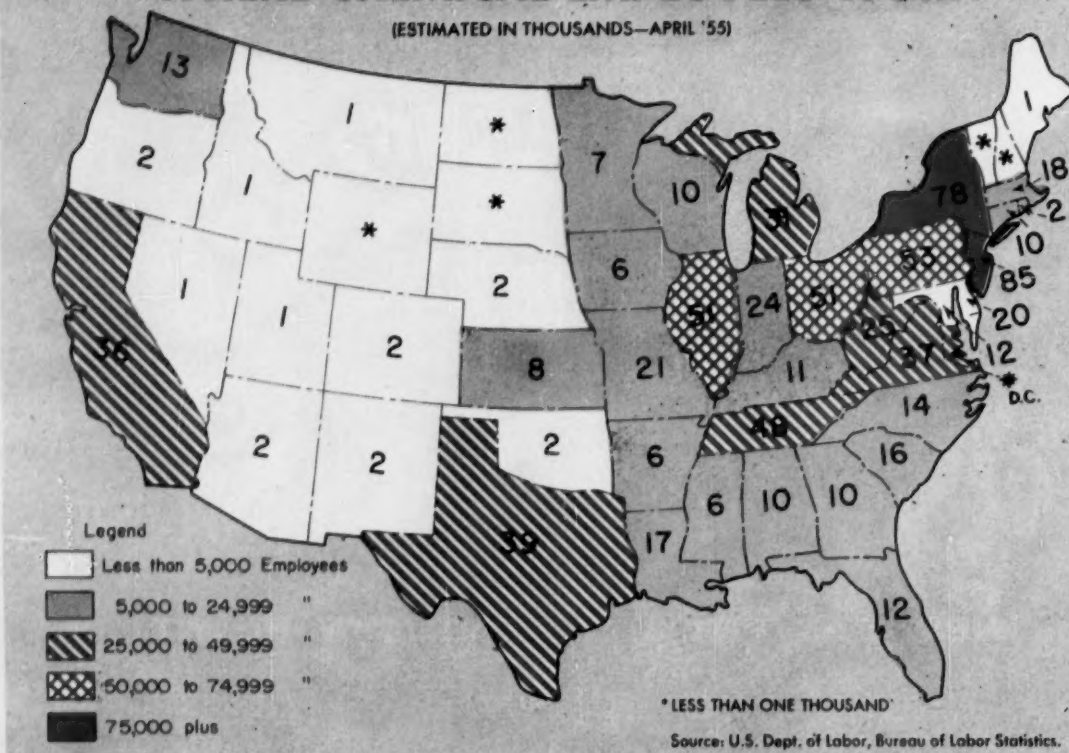
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WHERE CHEMICAL EMPLOYEES WORK

(ESTIMATED IN THOUSANDS—APRIL '55)



C W Report

of products and processes was the factor most often emphasized by company officials in discussing the reasons for recent expansion in their staffs of chemists and chemical engineers. This factor has actually tended to increase employment of scientific personnel in all types of activities. It has, for example, been one of the main reasons for their increased employment in administrative and supervisory posts and sales positions as well as in production and research.

Lately the rate of growth in scientific and engineering staffs has far exceeded that of total employment. Total employment in the chemical companies, included in the BLS survey, increased by about 14% from Jan. 1948 to Jan. '53, whereas the to-

tal employment of chemists increased nearly 28%, chemical engineers 45%, and other scientists and engineers 62%. The largest percentage growth in employment of chemists occurred in research, development and in production. For chemical engineers, the increase was relatively greatest in administration and in research and development.

A recent study of scientific research and development in American industry** revealed that in Jan. '52 the chemicals and allied products industry was the third largest employer of professional research workers. Only the aircraft and electrical machinery industries employed more research personnel.

However, the study showed that the chemical industry had an average of only 0.9 supporting workers† per

research engineer or scientist, compared with 2.0 for the electrical machinery industry and 1.5 in petroleum refining. It might be profitable if chemical companies fully explored the possibility of extending their supply of professional workers by making greater use of technicians.

Heading West and South: Today, there are more than 11,000 chemical plants scattered throughout the country, with every state having at least one plant.

Nearly one-half the work force in the chemical industry is concentrated in the Middle Atlantic and East North Central regions. The three Middle Atlantic states—New Jersey, New York, Pennsylvania—rank one, two, three in the number of chemical industry jobs. Together they employ more than 215,000 chemical workers.

Although the number of chemical workers has increased in every region and every state since 1939, there has been a gradual shift of employment to the West and South. The Middle Atlantic and East North Central States, the two regions employing the

**Scientific Research and Development in American Industry, Bulletin 1148, U.S. Dept. of Labor, Bureau of Labor Statistics, Oct. '53.

†Supporting personnel include all employees (except engineers and scientists) who do work connected with research and development programs. These include technicians, draftsmen, laboratory assistants, skilled craftsmen and administrative personnel.

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COOPER ALLOY

CORPORATION BRIEFS

• Edited by GEORGE BLACK

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Electronic manufacturers have found the answer to the problem of pumping the ferric chloride needed by their Printed Circuit Departments. The Vanton "flex-i-liner" with Buna N body block and Natural Rubber flexible liner is perfect. Since it operates equally well in either direction, a simple reversing switch on the motor provides for quick change in direction of flow.

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Effective September 15th, Western Alloys & Metals Limited became authorized distributors for Cooper Alloy stainless steel valves, fittings and accessories. They will serve the three western Provinces of Canada: British Columbia, Alberta, and Saskatchewan.



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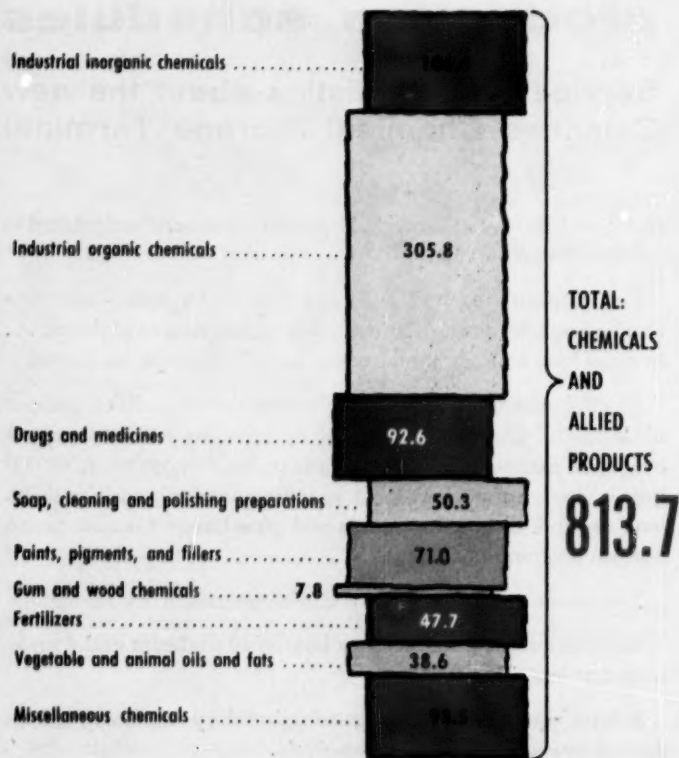
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CW Report

EMPLOYMENT BY INDUSTRY SECTOR

(IN THOUSANDS — APRIL '55, PRELIMINARY)

Source: U.S. Dept. of Labor, Bureau of Labor Statistics.



greatest number of workers, now have a smaller proportion of the industry's employment than they had in 1939. The West South Central region has shown a particularly large growth during this period, increasing from 4% to more than 8% of the industry's total employment. Particularly sharp rises in chemical employment occurred in Texas, where the number of jobs grew from 8,000 to 40,000, and in Louisiana, where employment expanded from 5,000 to 17,000. Other states with large increases in employment were Washington, where a 10-fold increase occurred, and Tennessee, which increased its employment from 16,000 to 48,000 in the 1939-55 period.

But withal, shifts in employment areas are relatively insignificant compared with the increasing emphasis on automation and the subsequent rise in individual output. More expensive than the older machinery, the new

automatic equipment, management feels, repays the difference with interest in increased production. And this trend provides the key at least to the foreseeable future manpower patterns of chemical employment. Along with continued over-all industry expansion and a rise in individual output, employment will continue upward, though at a less angular rise than before. Maintenance workers will show the greatest percentage increase; production workers, the least.

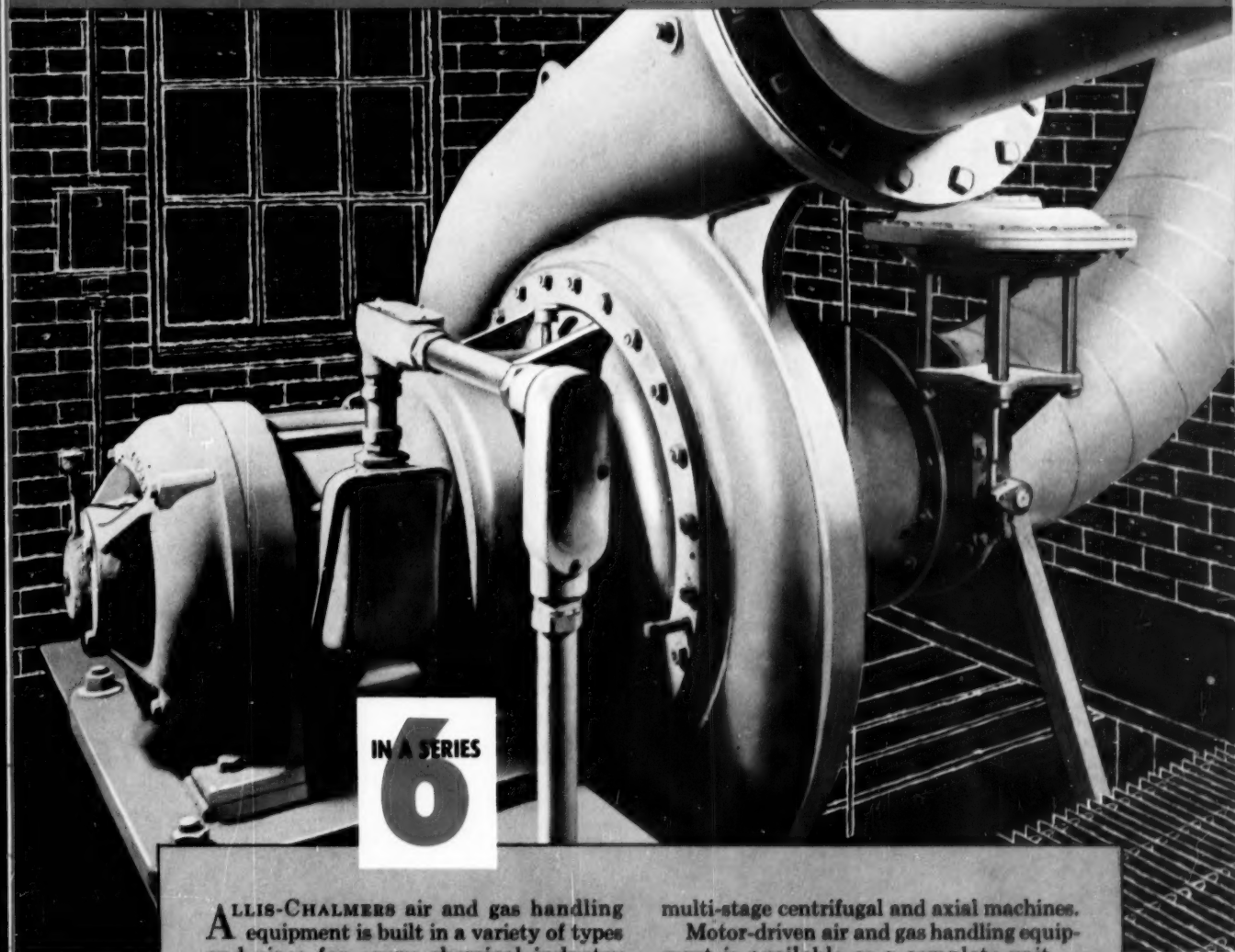
Reprints Available

Copies of this report are available from Chemical Week, Reprint Dept., 330 W. 42nd St., New York 36, N. Y., at 35¢ each.

Prices for bulk quantities (over five copies) and for previous CW Reports are available upon request.

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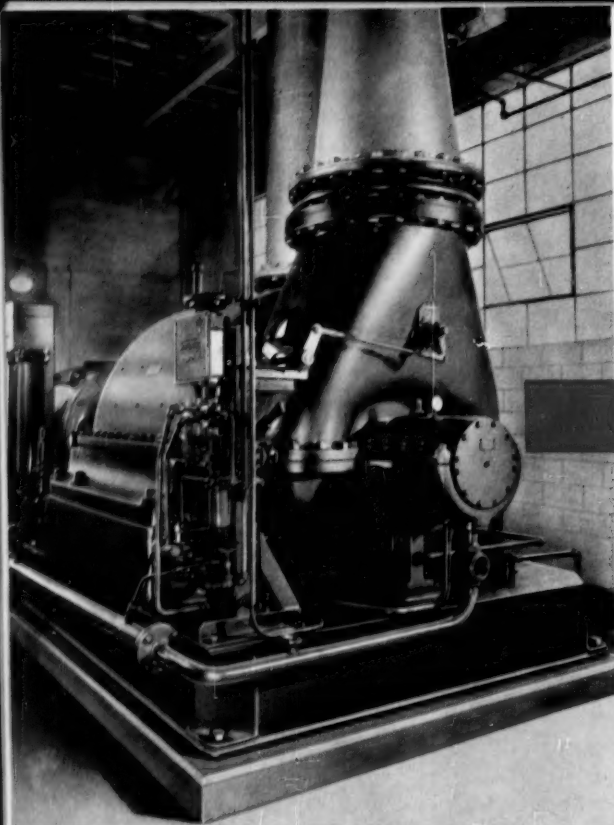
multi-stage centrifugal and axial machines.

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ALLIS-CHALMERS





ALLIS-CHALMERS single and multi-stage blowers are supplied for either motor or turbine drives with automatic flow or pressure control. Applications include gas boosting and exhausting, agitation, aeration, and circulation. Special casing materials available for handling corrosive gases include cast steel, chrome steel, bronze, 18-8 stainless steel, and carbon-molybdenum steel.

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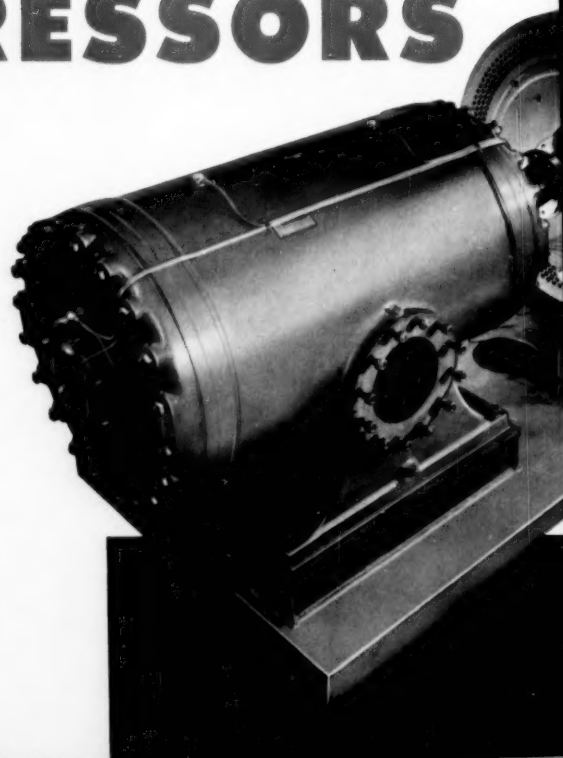
Rotary COMPRESSORS

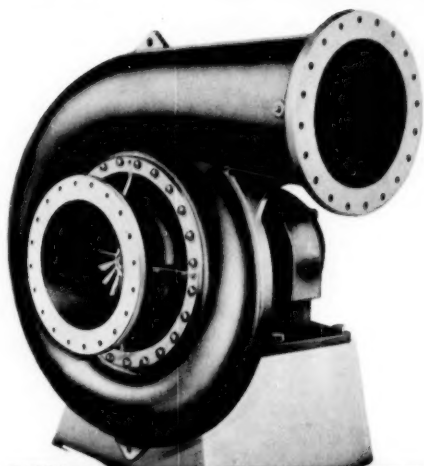
Allis-Chalmers rotary compressors and vacuum pumps are the sliding vane type. These units consist of a water-jacketed casing with eccentrically supported rotor-fitted blades which move radially in and out of longitudinal slots. In operation, blades are forced out by centrifugal force, forming cells in which air or gas is trapped for compression or evacuation. Thus these units have positive displacement characteristics.

Single-stage rotary compressors are available for 49 to 3245 cfm with pressures of 5 to 50 psig. Two-stage compressor units are built for 387 to 1807 cfm, from 60 to 125 psig.

Single-stage vacuum pumps are applicable for 22 to 5950 cfm at vacuums from 0 to 20 inches Hg. Two-stage pumps are supplied in various capacities up to 29.9 inches Hg.

With Allis-Chalmers rotary compressors and vacuum pumps, high speed operation makes possible a compact unit . . . minimizes floor space requirements. Rotary motion eliminates vibration, simplifies foundation needs. Smooth air flow cuts piping costs, eliminates need for dampening air receivers. Units are self-contained, suitable for direct connection to electric motors or internal combustion engines.





SINGLE-STAGE BLOWERS

Allis-Chalmers single-stage centrifugal blowers are built in pedestal mounting and overhung types for discharge pressures up to 7 psig. Close-coupled design and high speed rotary operation make possible a compact unit — a unit that can be mounted in very little space on a light foundation. Blower construction is simple. The only moving part is the impeller (radial or backward flow).

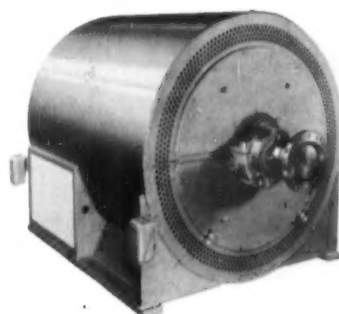
MOTORS

Allis-Chalmers builds a complete line of squirrel-cage, wound-rotor, synchronous, and direct-current motors, with electrical and mechanical modifications to meet any application.

The Allis-Chalmers fin-type, totally-enclosed, fan-cooled motor has a corrosion-resistant cast-iron frame. Rib-type design provides ample reserve cooling capacity. No inaccessible air passages. Improved bearing design affords maximum protection against foreign matter... facilitates in-service lubrication. Available in 1/2 to 100-hp range.



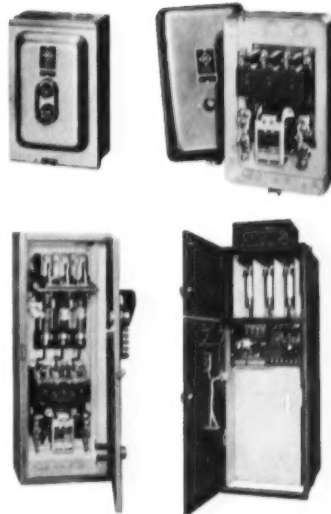
The standard Allis-Chalmers tube-type, totally-enclosed, fan-cooled motor may be modified for chemical plant application. If desired, this motor is available with cooling tubes, stator end-plates and external fan made of metals resistant to acids or alkalis. Explosion-proof types differ from standard machines only in minor mechanical details. Ratings range from 40 to several thousand horsepower.



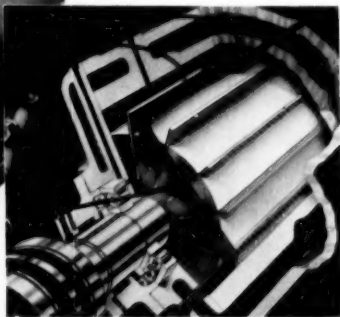
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Allis-Chalmers motor controls combine maximum line-to-motor protection with highly efficient operation and low maintenance. The extensive line of full and reduced-voltage starters includes manual and magnetic, reversing or non-reversing, single or multi-speed controllers. Starters as well as pushbutton stations are supplied in general-purpose or special cabinets, such as water-tight, dust-tight and explosion-proof enclosures.



Cutaway view shows sliding-vane construction, water jacketing, and lubrication connections of Allis-Chalmers rotary compressor.



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Sea Lamprey Killer



MICHIGAN DEPT. OF CONSERVATION

NO FISHING: Since the lamprey struck, the commercial fishing fleets stay tied up.

The Scene: The Great Lakes, principally Lakes Huron and Michigan.

The Cast: Lake trout and whitefish, sea lampreys, Fish and Wildlife biologists, the chemical industries.

The Story: A dangerous, merciless killer, the sea lamprey, has invaded the Great Lakes.

Within a few decades, the lamprey has nearly wiped out the commercial (and sport) trout fishing in Lakes Huron and Michigan, poses a serious threat to Superior's. So far, it has defied the best mechanical and electromechanical methods devised by the Fish and Wildlife Service to halt its depredations.

But there's one big hope: a chemical larvacide to kill the lamprey before it begins its damaging career. Considering cost of present semisuccessful control measures, public agencies seem willing to spend a third of a million dollars yearly for an effective antilamprey chemical.

Until this year, no chemical had even shown enough promise to get a full field trial. Right now, however, two have shown enough merit to be tried in Great Lake streams. But there's still room for research—the chemicals, now only custom-made, are quite expensive. And there's the possibility that they won't be effective, in spite of promise in the lab.

Water War: To aid in the search for a lamprey killer, you have to know what you're up against. As described by FWS's Vernon Applegate and James Moffitt at the fishery labs in Rogers City, Mich., where most research is being done, the lamprey is a formidable foe. It's an eel-like fish 12-24 in. long as an adult. Spawned in streams tributary to the lakes, it spends perhaps six years of its seven-year life in the stream or its bed. Then it heads for the lake.

At this stage, the lamprey has a mouth about equal

to its diameter, rimmed with horny "teeth," and equipped with a file-like tongue. It attaches itself to a victim (often trout or whitefish), tears a hole in the side of the helpless animal, and sucks out blood and life juices. It can kill its host in as little as four hours, may take a week. During its parasite phase, it can destroy a large number of fish. Its effect in the Great Lakes, Applegate and Moffitt say, has been "catastrophic."

It is no empty term. In the decade or more since it has been a serious problem,* it has caused Lake Huron's trout production to fall from a peak of 5,998,000 lbs. in 1935 to 344,000 lbs. in 1953; Lake Michigan production dropped from 6,860,000 lbs. in 1943 to an inconsequential 3,000 lbs. in 1952.

Get Them Young: Because the lamprey spends perhaps 80% of its lifespan in streams, where it is relatively harmless, it seems logical to try killing it at that point. Mechanical and electromechanical weirs—a sort of screen or dam that can halt fish but not water—have been built on a sizable portion of the streams tributary to Michigan and Huron (perhaps 200 streams are suitable for lamprey breeding). But these devices are expensive to install, expensive to maintain. They are slow in producing results, too—it will be nearly seven years before their value can be fully appreciated. That's why FWS workers seek chemical aid.

Already, they've screened over 5,000 compounds for larvicidal effectiveness [wholesale lake "cleaning" with something like rotenone (*CW*, Oct. 9, '54 p. 80) is obviously impractical for the Great Lakes]. Making

*In Huron and Michigan, the problem is most serious, though the lampreys are common in all the Great Lakes. Long found in Lake Ontario (the lake nearest the sea), it was spotted in Erie in 1921. It didn't prosper there, but when it hit Huron in the '30s, its numbers increased meteorically, and it jumped further when Michigan was invaded in the '40s. Now it is in Superior, growing fast.

Target

(Continued)

the problem hard: biological activity of a compound in no way proves the activity of its isomers or related compounds—each must be tested individually.

Look to Two: In spite of the magnitude of the chore, Applegate and Moffitt have uncovered two compounds that look good in tests. One is 3-bromo-4-nitrophenol, now being synthesized at Bucknell University (*CW Technology Newsletter*, Nov. 26). FWS will likely get a use patent on it as a larvicide. About the second compound, also not commercially available, FWS must keep mum at present, since its manufacturer has a patent position to protect.

Because of the promise of these compounds and because of limited personnel, FWS is now concentrating on these two chemicals, won't start screening new compounds until these are proved out—one way or the other—by next March.

But its plan for screening, a relatively simple test procedure, is available to anyone.† It separates those compounds that at low concentration (5.0 ppm. to start) will kill lamprey larvae without hurting fingerlings. Compounds that can pass this test will have to be field-evaluated by FWS.

FWS researchers don't think any compound costing more than \$20/lb. delivered would be feasible. The compounds now under test are somewhat more costly than this—there's unquestionably room for cheaper syntheses.

Time to Act: One big reason for the FWS go-ahead on the two compounds is that time is getting short. There is still hope that Lake Superior can be used as a source of eggs to restock other lakes—if the lamprey can be killed off. Use of weirs to control lampreys may take a decade, by which time Superior would likely be infested, and there would be a long job building up the trout population. In any case, it will be years before the commercial game fishing business can again become the \$10-million annual industry it once was.

†Sea Lamprey Larvicide Test, Hammond Bay Fishery Laboratory, Great Lakes Fishery Investigations, U. S. Fish and Wildlife Service, P. O. Box 28, Rogers City, Mich. Suitable fingerlings are available from commercial fish hatcheries; lamprey larvae may be harder to get.

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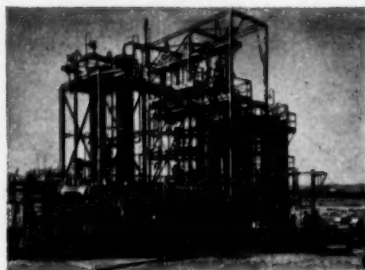
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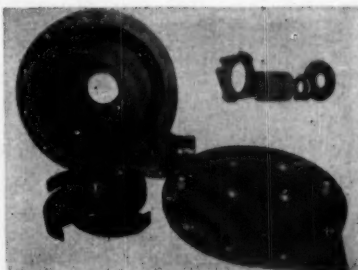
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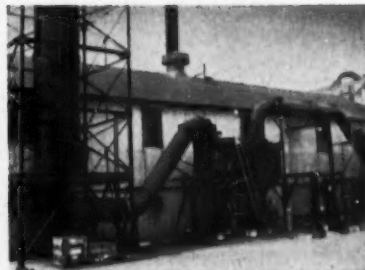
TRADE MARK REG. U. S. PAT. OFF.



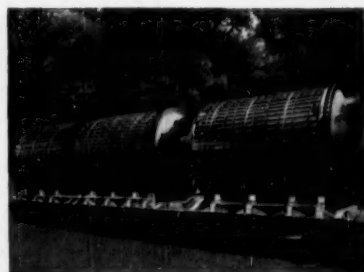
PETRO-CHEMICAL plants have been designed and built primarily around the use of Haveg . . . in pressure tanks, absorbers, pipe.



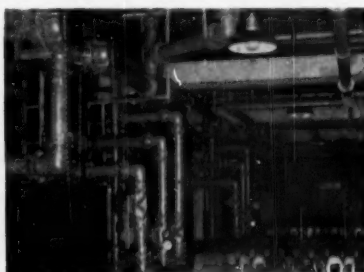
PUMP PARTS, made from Haveg, used in hot acid, last over 33 months without replacement. Even longer life is common.



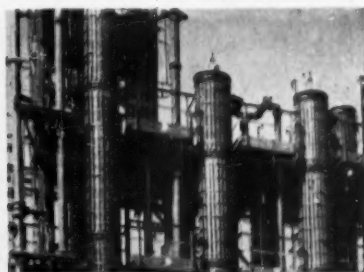
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Also, to more completely cover customers' requirements, the Haveg Corporation has added to its long list of corrosion-

resistant products: Polyester-glass and polyvinyl chloride equipment. A wide range of acid-proof cements for brick work and field fabrication. Specialties made from duPont's Teflon—sheets; gasket, packing, diaphragm materials; rods, tubes.

For full information, call the sales engineer listed, see Chemical Engineering Catalog, write for new 32-page Bulletin C-12.

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1. Spent alkylation acid is mixed with fresh sulfuric, containing SO_3 , to remove water.
2. Fortified acid is then dispersed as fine droplets in a supporting medium of liquid propane-isobutane.
3. Dispersion is mixed with a slurry of sulfuric acid seed crystals.
4. Mixture is cooled to the freezing point by auto-refrigeration as a portion of the pentane-isobutane mixture vaporizes.
5. Sulfuric acid crystals are separated from impurities in the mother liquor by centrifugation.
6. Adsorbed impurities are removed by washing with additional liquid propane-isobutane.
7. Washed crystals are liquefied by heating in a melting vessel.
8. Purified sulfuric is adjusted, by the addition of spent acid, to the concentration at which it can be fed back into the alkylation reaction. That's how . . .

Freeze-Out Saves Sulfuric

When it comes to the recovery of usable sulfuric acid from spent petroleum treating liquors, there aren't many feasible methods that haven't been tried. But chemical engineers stubbornly keep trying to come up with new and better processes that will ease the acid user's lot. One of the latest to reach the commercial testing stage is M. W. Kellogg's (New York) freeze-out method.

Taking a completely different tack than did earlier decantation and more recent carbonization techniques, the Kellogg process combines principles of auto-refrigeration and fractional crystallization to separate acid from impurities. It's intended primarily for the recovery of spent alkylation acids, particularly those containing more than 90% total acidity (expressed as H_2SO_4).

At latest report, the first commercial installation had been shut down pending some further development work in the laboratory to iron out operating kinks. And though Kellogg isn't prepared to plug the new process until it's passed economic evaluation tests, this (according to U. S. Pat. 2,716,592) is how it works:

Controlled Eutectic: A key factor influencing the yield and purity of regenerated acid is close control of

the mixture from which it's crystallized. As it comes from the alkylation reaction, the contaminated acid contains monoalkyl sulfate, dialkyl sulfate, high-molecular-weight polymers, and water. These impurities determine both the amount of sulfuric that will remain in the mother liquor and the eutectic point, below which impurities crystallize.

Contaminant control begins with regulation of the water content by the addition of sulfur trioxide or oleum. This treatment removes substantially all of the free water, which would otherwise cause excess sulfuric to be left in the mother liquor.

The fortified acid is next passed through an eductor where it's finely dispersed and suspended in 2-25 volumes of liquid propane-isobutane. Fine dispersion facilitates crystallization by providing a maximum surface area for the flow of heat from acid droplets. The triple-purpose pentane-isobutane mixture acts as a diluent to reduce the viscosity of impurities at the crystallization temperature, as the cooling medium, and as spacing medium for the crystals during centrifugation and washing.

From the first mixer, the spent acid emulsion enters a second eductor in the crystallizer. Here, it's mixed with

a slurry of sulfuric acid seed crystals, which initiate crystallization, avoid supercooling effects. Temperature in the crystallizer is maintained at -30 to -20 F by controlling the pressure at about 5 psig. At this pressure, part of the propane-isobutane vaporizes, absorbing heat of vaporization from the crystallizing acid and remaining liquid.

As the resulting slurry of sulfuric acid crystals is withdrawn from the bottom of the crystallizer, a portion is recycled for seeding purposes. The rest is pumped into a basket-type centrifuge, which spins out the impurity-laden mother liquor. When the crystal cake builds up to a predetermined thickness, slurry feed is cut off and the cake is washed with liquid propane-isobutane. At the end of the wash cycle, a scraper pares all but a thin layer of crystals from the drum, and the slurry feed valve is reopened.

Washed crystals are discharged to a melting vessel where they're liquefied by the indirect exchange of heat from condensed vapor leaving the propane-isobutane compressor. Regenerated acid (about 99% sulfuric) is withdrawn from the melter, combined with a small portion of spent acid to provide the 95-96% concentration at which it's returned to the alkylation reaction.

The basic operations—auto-refrigeration, fractional crystallization and

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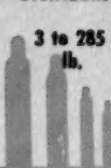
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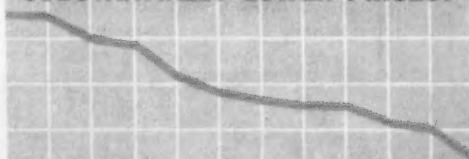
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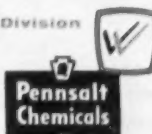
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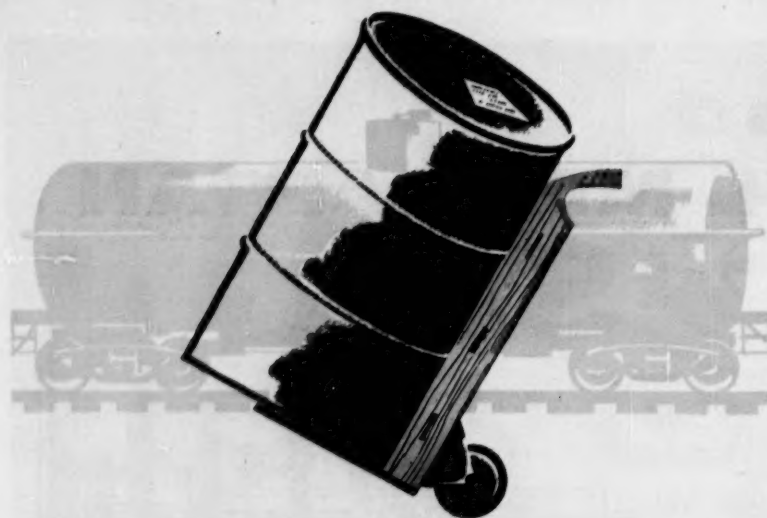
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PRODUCTION

centrifugation—are well known, have been employed in various chemical processes for many years. But it took the addition of an organic liquid carrier to adapt them to the alkylation acid recovery process. All it needs now to make the grade is proof that it will work on a production basis.

When the Atom Arrives

The electricity that supplies your cells and turns your motors will come from the atom and will cost 6 to 7 mils/kwh. in large blocks. And this will take place in 5 to 10 years, if the crystal ball of U.S. Atomic Energy Commissioner Willard Libby was not clouded over when he spoke before the Rice Institute Associates in Houston last fortnight.

As he views it, stationary atomic power may become vitally necessary to the United States in a matter of decades. At the present time, power is available in large blocks for about 6 mils/kwh. The general average for the country is 7.4 mils. Atomic power, to be competitive, will have to meet the lower figure. And he believes this can be done in 5-10 years.

Other points of Libby's speech significant to process industry engineering management:

- Efforts have been made to translate the experience of the Russians with atomic power. The difficulty is that at Geneva the Russians quoted costs in kopecs. No one knows the value of a kopec in our currency.
- Regarding heat from atomic reactors: "Atomic heat is already an established reality . . . at Hanford. It . . . is obvious that any atomic pile operating . . . has an enormous quantity of by-product heat produced at the rate of 70 billion Btu/kilogram of uranium consumed in fission." Therefore, atomic power plants will furnish heat at attractive prices. At the same time, the heat can be used only at installations close to the reactor.
- At the Hanford plant, atomic space heating saves 1.5 million gal./year of fuel oil, or approximately \$100,000/year.
- On isotope control: "We estimate that American industry during the last year saved approximately \$100 million in processing costs by the use of isotopes." And this is conservative. In five years, the savings may go as high as \$1 billion. And the surface hasn't



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PRODUCTION

even been scratched. In particular, there's a big potential future for routine use of tracers like carbon-14 and radioactive hydrogen in small amounts for ordinary processing.

• On radiation: the induction of polymerizations by the use of gamma radiation may be established within the next two or three years.

Sterilization—or at least pasteurization—of food by gamma radiation is "quite close." The possibility of toxicity in such foods is being investigated vigorously and the answers should be ready in a matter of years. A more serious problem is evidence indicating that the taste of such foods is affected. But that still has to be evaluated.

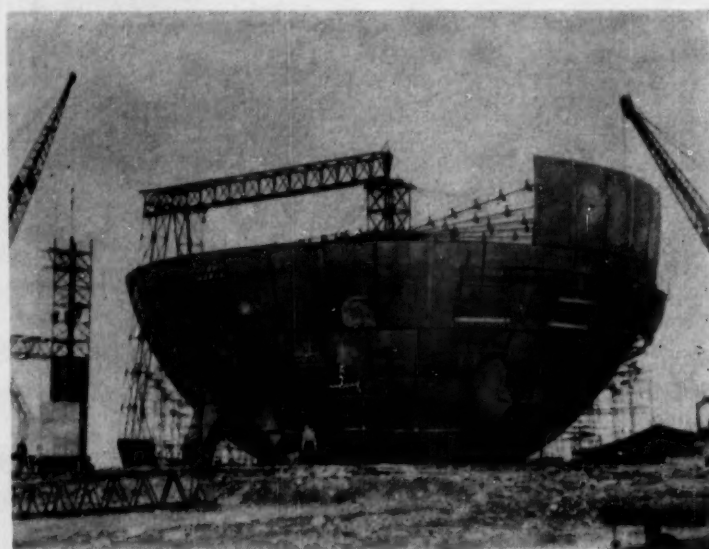
But, warned Libby, development of peaceful uses of the atom depends on the development of manpower. Right now, the only real blocks delaying the atom's arrival are: very tough technical problems, the shortage of high-level technical personnel.

Dry Peroxide

It's been an uphill struggle, but Becco—just about nine years after it found it could make 90% hydrogen peroxide commercially—last week revealed that it's now prepared to make the material at "virtually 100% purity."

The secret of its success: a continuous fractional crystallization (as outlined in U.S. Pat. 2,724,640) used in conjunction with a conventional fractional distillation. In practice, it will probably work this way: Crude hydrogen peroxide will be dried to 90% by fractional distillation. That will be fed to the countercurrent fractional crystallizer where the take-off concentration will range between 98-99.6% hydrogen peroxide, which Becco pegs as the practical maximum concentration by its new process.

In addition to a drier product, Becco feels that the new peroxide

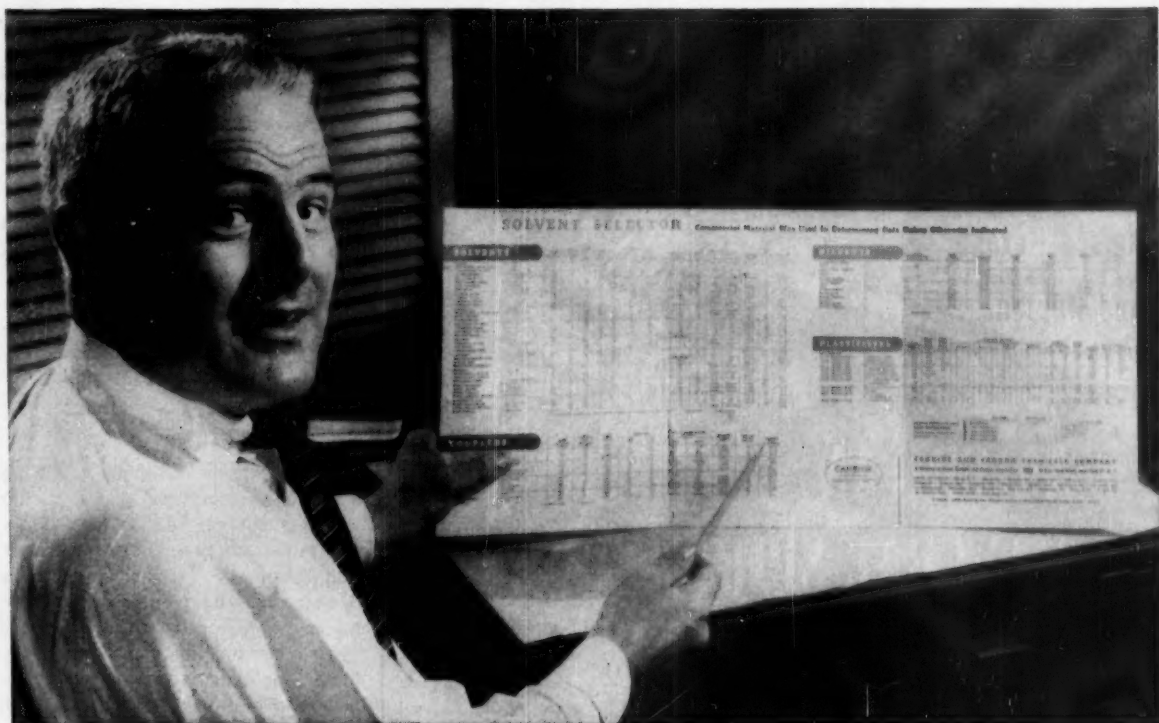


Nuclear Breeder in a Bubble

HOME OF BRITAIN'S second atomic power station will be this 135-ft. steel sphere rising at Dounreay in Caithness, Scotland. A large fast breeder, the new reactor is a scale-up of Britain's Zero-Energy Fast Reactor located at Harwell.

Only official word on the plant's

power level: it will be "far more powerful" than the first plant at Calder Hall in Cumberland. Though it won't be commercial from a cost standpoint, the electricity produced will be fed to Britain's National Grid—the nationwide electrical distribution system.



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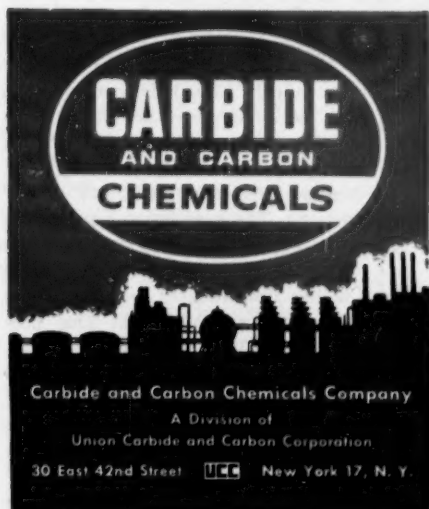
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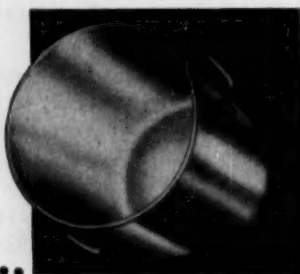
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PRODUCTION

will give the user other dividends on purity; for the crystallization step eliminates most of the impurities present in the 90% material. Since that meets American Chemical Society specifications for reagent-grade (30%) hydrogen peroxide, Becco points out the anhydrous material will be well within existing specifications.

Says Becco President Max Bretschger: "This is the end of the development . . . a milestone in the history of the hydrogen peroxide industry."

Safe Deal

A gigantic poker game involving 1,600 hands and no chance to do anything but win. That's how James McMahon, safety supervisor at Kaiser Aluminum & Chemical Corp.'s Spokane, Wash., plant sees the new safety incentive program at the plant.

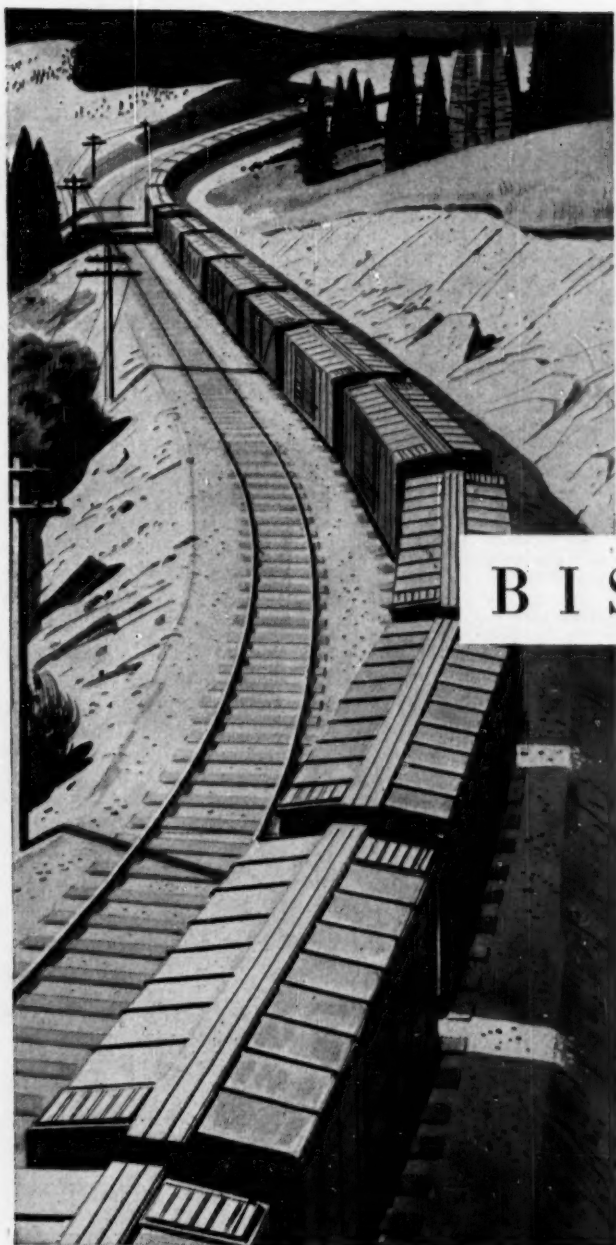
This is how the game is played: Each employee receives a card attached to his weekly paycheck. It's a regular playing card on the face, but on the back are the employee's name, his number, the date—and a safety slogan. Then, every week, employee clock numbers are placed in a container and 25 are pulled out. The first 10 who know the safety slogans printed on their cards win \$5 gift certificates.

This is done for five weeks. At the end of that time, the 50 winners are declared "in" on the poker game. The game is played on the basis of the cards attached to the paychecks; winners receive \$100 certificates. Employees who have suffered a lost-time accident during the five-week period declare their hands "mixed deals."

EQUIPMENT

Jet Nozzles: Bete Fog Nozzle, Inc. (Greenfield, Mass.) is out with its O.J. Series opposed jet impingement nozzles that are said to provide maximum uniformity of drop size, highest atomization efficiency at any pressure. The new design assures long operating life, says Bete, because there are no internal parts to clog, and since laminar flow reduces wear at nozzle tips. They're available in four flow rates from 3 to 30 gpm., in bronze, aluminum or special materials.

X-Ray TV: Fluoroscopic images can now be transmitted to remote inspection centers via closed-circuit TV with the aid of North American



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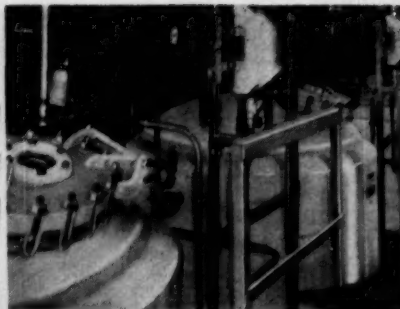
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Philips Co., Inc.'s (Mount Vernon, N.Y.) Norelco X-ray tube. Combined with an electronic intensifier that increases image brightness 1,200 times above the ordinary fluoroscopic screen, the device provides direct magnification without loss of detail, even in daylight surroundings. Added advantage: remote viewing reduces radiation hazard to zero.

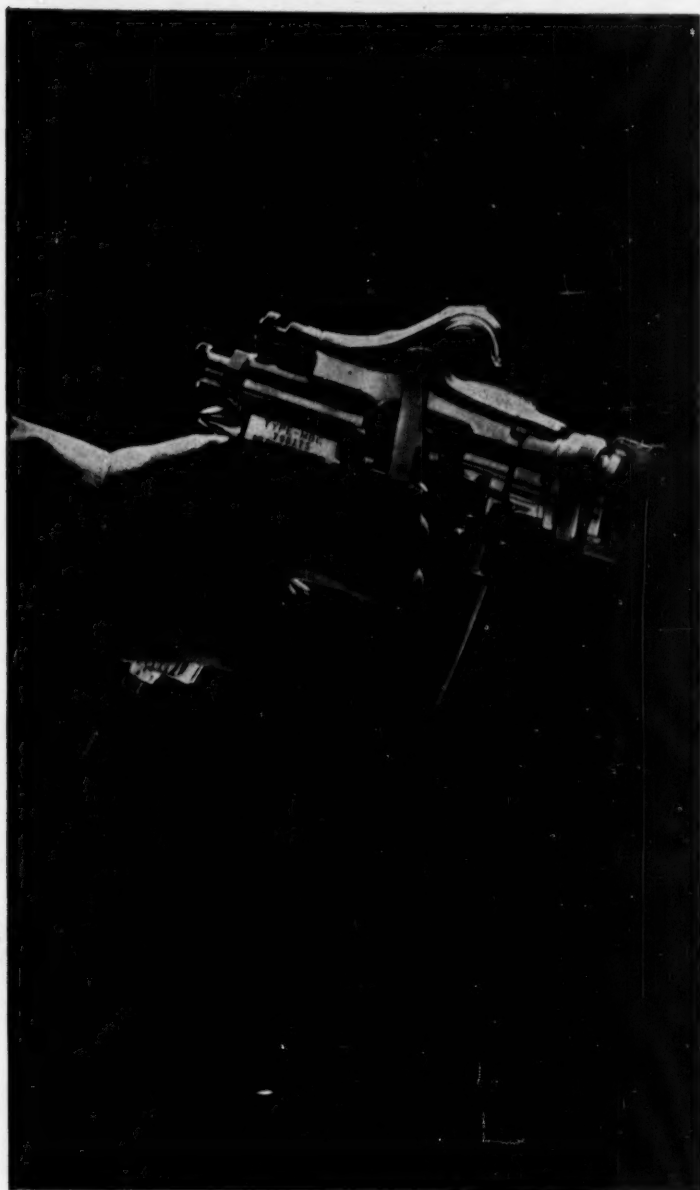
Electronic Weigher: To bridge the gap between the measurement and recording of weight, Toledo Scale Co. (Toledo, O.) has developed an electronic scanning unit that converts weights to digital outputs. The scanner counts lines on a special chart to achieve digital conversion without introducing any electrical drift, non-linearity, or friction errors. Output pulses can be used to actuate tabulating machines, adding machines, and other data-handling devices.

Quick Connect: A thumb and finger are the only tools needed to connect or disconnect the new Swagelok quick connect fittings. Crawford Fitting Co. (Cleveland, O.) makes them in tube-to-tube, tube-to-pipe, and bulkhead styles for use with plastic and metal tubing.

Fire-Fighter: Seco Safety Engineering Co. (Detroit) fills the gap between portable extinguishers and municipal fire apparatus with a new in-plant fire truck. Designated Model S-556, it carries CO₂, dry chemical, water, and foam extinguishers, travels at a speed of 15 mph.

Test Kit Offer: Now it's a do-it-yourself lab test kit to diffuse chromium into small pieces of ordinary steel to give them surface characteristics similar to stainless steel. That's the idea of Alloy Surfaces Co. (Philadelphia). As Surface Alloy sees it, the test kit will enable a firm to determine where and how chromium diffusion will fit into its operations. Then, if it decides the process is adaptable to its project, it can get one of two types of licensing arrangements (one for the original equipment manufacturer, the other for the contract processing plants). The kits, according to the manufacturer, supply all the instructions and materials (with the exception of the furnace) needed to diffuse the chromium.

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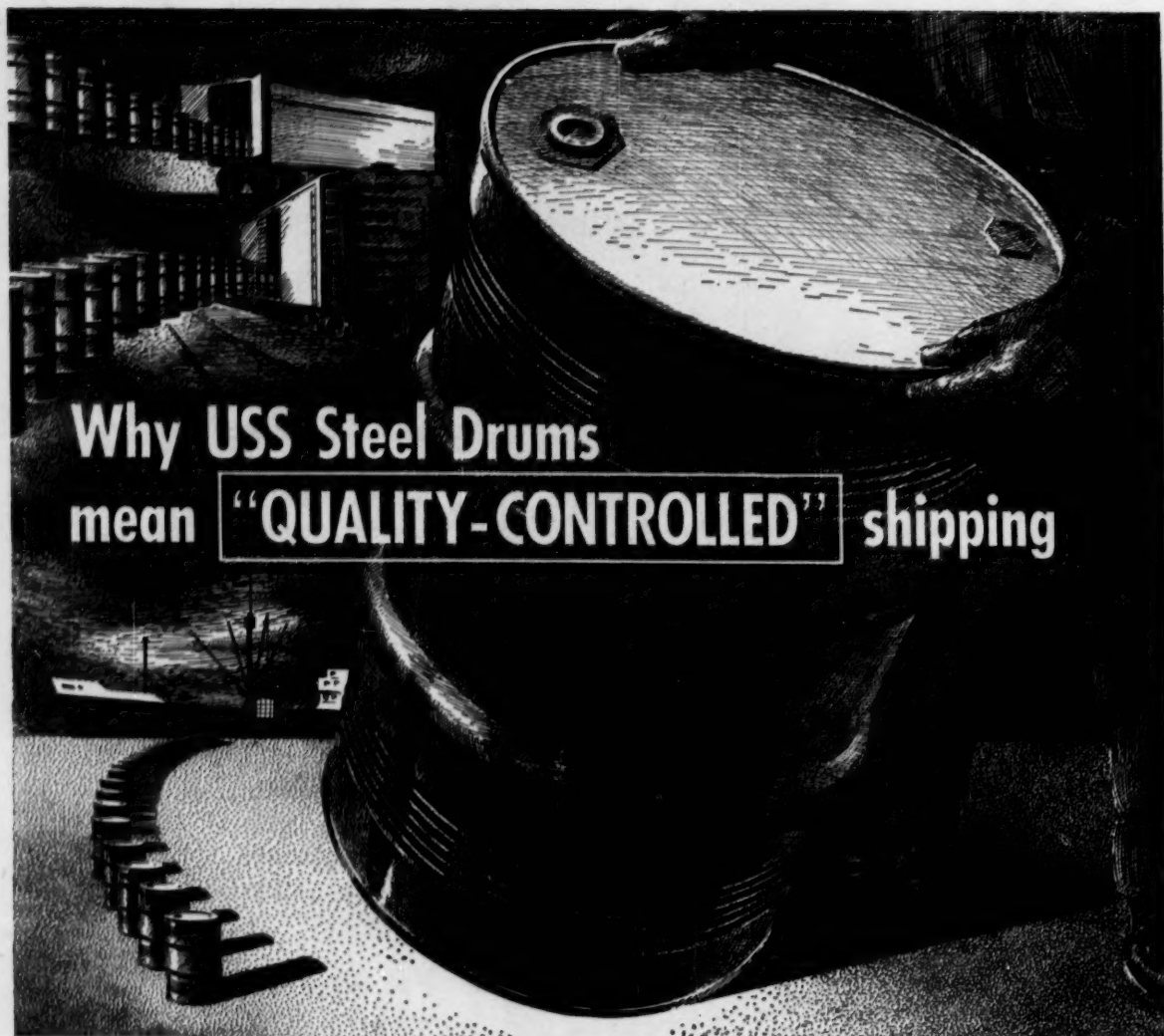
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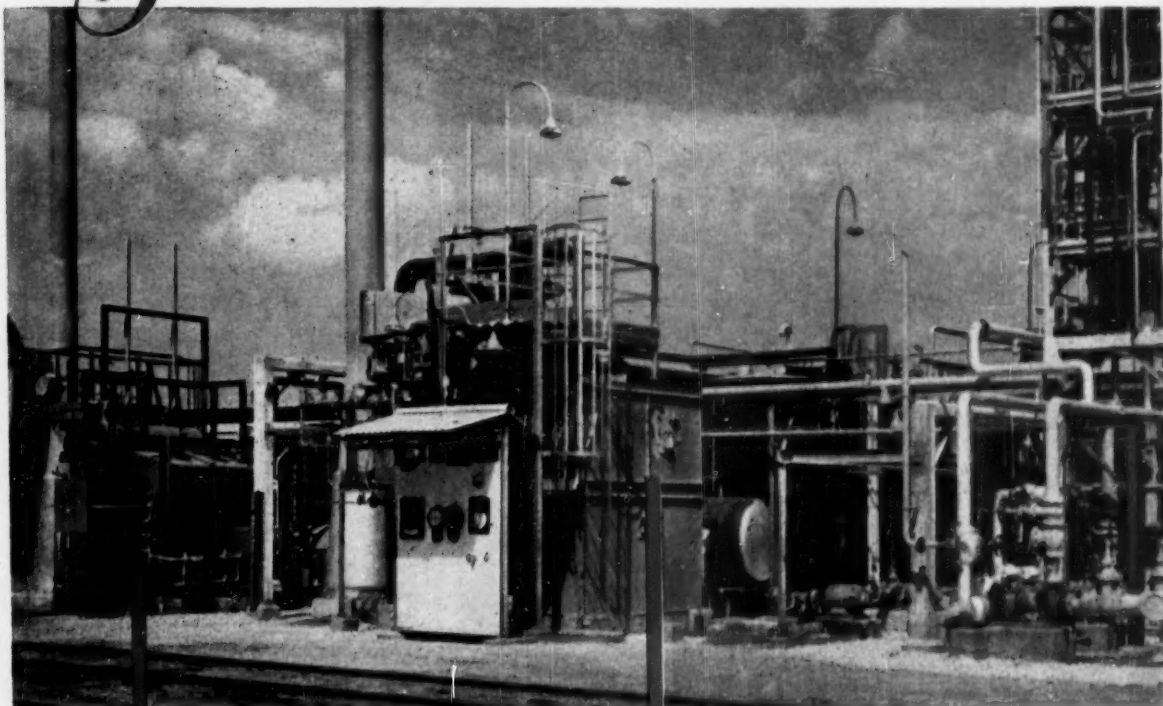
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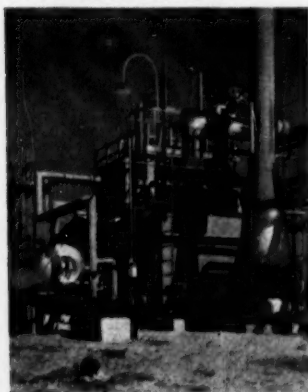
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Baltimore and other prime contractors, contributed significantly to these applications of chemical technology to long-range missile development. This is an excellent example of FMC basic policy of "putting ideas to work" in myriad phases of civilian and defense industry.

Through this forward-looking, growth company research policy on new chemicals and new applications of traditional chemicals, FMC Chemical Divisions have expanded the size and scope of their activities many fold in the past decade.



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Technology

Newsletter

CHEMICAL WEEK
DECEMBER 17, 1955

Is Chemical Construction's highly touted metals recovery technique (*CW*, May 17, '52, p. 43) at last about to live up to its promise? That would be the conclusion from the joint statement by Howe Sound and Chemico this week that Howe Sound is again taking over the active management and operation of its cobalt refinery at Garfield, Utah.

Basically, the process employs an acid leach and a high-pressure hydrogenation to extract metallic nickel and cobalt from sulfide ores. When the process was unveiled, it had the metals field buzzing. But the plant, originally scheduled to start up in July '52, was not running satisfactorily by Feb. '54.

Howe Sound and Chemico entered into a contract then, whereby, essentially, Chemico would take the plant over, make any necessary changes and show that the process was operable. Inside of two years, it would return the plant to Howe Sound. Actually, Chemico expected to have the kinks straightened out in considerably under the two-year period, has reportedly been paying a financial penalty on the plant for over a year.

Chemico had the plant going at capacity for six weeks. It's not at capacity now because Howe Sound has decided that some changes should be made immediately. These are expected to be completed in February, however, and output should then start to climb again. Meanwhile, it is operating "commercially." Reportedly, though, plans to make by-product ammonium sulfate for sale have been shelved.

The best way to make sodium dispersions may remain a controversial topic for years to come. But not if Cowles Dissolver Co. (Cayuga, N.Y.) has its way: the firm is hoping to settle the issue with a new package dispersion maker.

Available in laboratory and pilot-plant models, the device utilizes a flat saw-toothed stirrer disc to build up a strong hydraulic shearing action. The 3-in. lab model operates at 4,000-5,000 rpm., is said to produce 1-2 qts. of a 2-to-20-micron dispersion in 6-8 minutes. U.S. Industrial Chemicals, which evaluated the device, calls it "extremely efficient."

Cost of the complete lab package unit (complete with resin flask, heating mantle, all accessories): about \$500. The pilot model will go for approximately \$850, while production units will probably sell for \$1,500 and up, depending on size. A kit of lab-size essentials will be available for about \$225.

Despite U.S.I.'s favorable report, the Cowles apparatus won't have an easy time winning over partisans of mills, blenders, stirrers and various other devices—Premier Mills' Dispersator is perhaps most familiar—now used for sodium-dispersion making. Reason: a number of such researchers, checked by *CW*, say that they have tried the impeller principle, like their own methods better.

Sulfuric acid recovery from waste pickle liquor is being dusted off and being introduced to daylight again as the result of a decision by seven steel companies to try out a Blaw Knox process. B-K will design, build and operate a small-scale, 650-ton/year demonstration plant at Niles, O., to treat the pickle liquor from Republic's plant. (The seven steel makers: Jones and Laughlin, National Steel, Republic Steel, U.S. Steel, Youngstown Sheet and Tube, Wheeling Steel and Pittsburgh Steel.)

Cost of the plant has not been discussed, but it shouldn't run over \$200,000. It's scheduled to start up by late summer next year, if it proves out,

Technology Newsletter

(Continued)

the next step will be a commercial unit, centrally located to serve several neighboring plants.

The process was developed by Othmar Ruthner, of Vienna, Austria, and has been probed by Blaw Knox for two years on a small scale. In it, the ferrous sulfate in the spent liquor reacts with hydrochloric acid to regenerate sulfuric and to form ferric chloride. The chloride (with water) is heated in a furnace to iron oxide and hydrochloric acid, which is recycled. The beauty of it, as Blaw Knox sees it, is that no by-products are formed. The iron oxide can be sintered and returned to the blast furnace; the hydrochloric can be used in the recovery process, and the sulfuric, of course, in the pickling. There's evidence, too, that the inhibitors used in the pickling solution go right through with the sulfuric, hence the process might bring about savings in the use of inhibitors.

There have been any number of processes developed to recover sulfuric from pickle liquor. But none has ever really been economically attractive here—principally because of the availability of cheap sulfuric acid. Blaw Knox, however, is nursing big dreams for this one. Attainment of the goal will be doubly sweet, in view of an earlier report (from England) that the process was not sound. Blaw Knox, however, has added some tricks, that, it feels, make the process not only sound but also highly operable. The firm has patent applications on it in the mill.

A new opportunity for chemicals in the atomic field was spotlighted in Washington last week at a reactor seminar held by AEC. Specifically, the commission revealed that it is now negotiating a contract to test an organic- (instead of water-) cooled reactor. Dowtherm C, a mixture of di- and triphenyls, is said to be one of several coolant candidates.

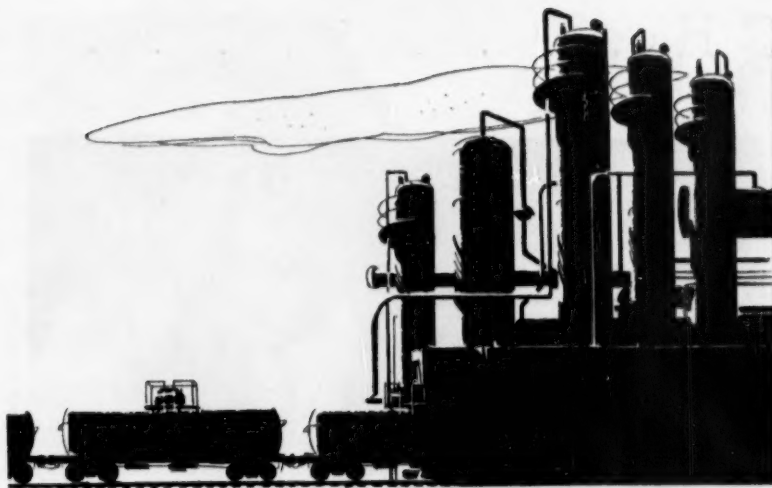
Strictly as heat-transfer agents, many organics would be superior to water for reactor use. But they don't stand up to radiation as well as water, yield decomposition products that can gum up delicate mechanisms within the heart of solid fuel reactors.

That problem, however, is not nearly so critical in the relatively new liquid-fuel reactors. Liquid-fuel reactors do not need the close-tolerance assemblies vital to their solid-fuel counterparts—so there is some leeway for breakdown residues.

Whether Dowtherm C, and polyphenyls in general, is entirely satisfactory is a question AEC is not now answering.

If present plans go through, the newly formed Cumberland Corp. will build a \$2.4-million plant to make charcoal briquettes and furfural from residual hardwood timber and sawmill waste. The plant will be located at Burnside, Ky; construction is due to start shortly after Jan. 1.

Few details are available about the processing. But a recent patent assigned to the firm (U.S. Pat. 2,725,346) spells out a process that would tie in nicely. It describes a method of heating a mixture of saw dust and large wood pieces until the saw dust decomposes exothermically—without affecting the larger pieces. That forms organic acids that catalyze the formation of furfural from the pentoses present in the larger pieces. The furfural is separated, and the remaining wood is heated above the exothermic decomposition temperature to form charcoal.



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Briefs

from Recent Literature

Ethanolamine

Efficacious ink removers may be prepared for general use by incorporating a polyethylene-glycol base with an ink solubilizing or decolorizing material such as the triethanolamine and oxalic acid salt having only one free or unneutralized carboxyl group; i.e., the triethanolamine acid oxalate.

Dyeing of cellulose acetate or other esters of cellulose textile materials with indigoid vat dye-stuffs, giving textile materials fast to light, to acid fading and substantially free from crocking, may be done by impregnating a dried dyestuff material with an aqueous solution of sodium sulf-oxylate formaldehyde and 5-10% by weight of diethanolamine.

A compound of triethanolamine and a dibasic acid combined with a triethanolamine fatty-acid salt provides an improved antistatic composition. Artificial staple fibers treated with it can be carded and spun without generation of static electricity. The dibasic acid salt is incorporated in amounts ranging from 0.5 to 2 parts for each part of fatty acid salt. This mixture is applied as an aqueous solution in such a manner that the fibers retain 0.5 to 1.5% of its weight of the alkanolamine-dibasic acid salt.

Sulfides present a costly problem in the corrosion of ferrous metals in oil wells. A means is now at hand to reduce corrosive action by removing the sulfides from solution. The mixture, into corrosive liquids, of the fatty-acid derivative of an alkanolamine provides good protection. In laboratory testing, mild steel coupons were exposed to a 50-50 mixture of crude oil and brine. Corrosion rates of the coupons in the untreated mixture were compared with coupons in the same mixture which had been treated with 0.005 to 0.01 volume % of various fatty triethanolamine derivatives. Reduction in corrosion rates of 85% to 99% was achieved.

These developments are abstracted from recent publications or U. S. patents. They may suggest applications of Ethanolamine in your products or processes. Permission to practice inventions covered by unexpired patents can be given only by the owners thereof.

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Linking Mind and Matter



WARNER-LAMBERT

◀ Mental ward and lab are joined by the new quest for chemical keys to emotional ills.

DESPITE their vaunted clinical successes, the new "mental" drugs are still very much of a physiochemical mystery. That's the reason for the recent spurt in fundamental "mental" chemotherapy research. A three-tined program, it's aimed at finding: (1) links between chemical groupings and specific mental and emotional responses, (2) better techniques of drug evaluation, and (3) greater knowledge of brain chemistry.

The newest research organizations to enter the fray are Battelle Memorial Institute (Columbus, O.) and Fels Research Institute (Yellow Springs, O.), participants in a cooperative venture. Battelle chemists will synthesize promising compounds; Fels will see that they receive clinical trials.

Unlike most drug research, the program will not be a hit-or-miss proposition. Instead, the object is to develop a pattern for tailoring compounds to relieve mental maladies.

Behind this research is the feeling that mental disorders stem from chemical imbalances in the brain. That's why hallucination-producing drugs such as mescaline and lysergic acid diethylamide (LSD) are valuable. These induce abnormal mental conditions

(hallucinations, etc.), provide a test ground for potentially valuable chemical antagonists. The idea is to synthesize related compounds (possibly simple analogs) that are antagonists to these test agents.

Battelle chemists Richard Morin, Edward Kropa and Frederick Benington have worked so far on synthesis of compounds related to the hallucinogenic mescaline— β -(3,4,5-trimethoxyphenyl)-ethylamine—an alkaloid that occurs naturally in the cactus *Anhalonium*. Sample analogs*: 2,4,6-trialkoxy- β -phenethylamines; tetra- and penta-methoxy- β -phenethylamines; and 2,4,6-trialkyl- and 3,4-dihydroxy-5-methoxy- β -phenethylamines.

So far, no radically new mental drugs have evolved from this research.

Besides the Battelle-Fels project (backed by a U.S. Public Health Service grant), these programs are sharing the mental drug research limelight:

- At National Heart Institute (Bethesda, Md.), Bernard Brodie, Alfred Pletscher and Parkhurst Shore recently disclosed findings that serotonin (5-hydroxytryptamine) is linked to mental imbalance (*CW Technology*

*Reported by Morin, Benington, and Fels' Leland C. Clark, Jr.



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December 17, 1955 • Chemical Week





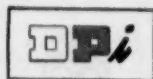
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RESEARCH

Newsletter, Dec. 3). The compound's production in the body is increased by the hallucination-producing LSD, decreased by the tranquilizing drug reserpine.

- Other studies of reserpine concern its effect on other physiological functions. Recently reported work by J. H. Hafkenschiel, A. M. Sellers, S. B. Langfeld and T. D. Whitsel (Edward B. Robinette Foundation, Medical Clinic, Hospital of the University of Pennsylvania) on hypertensive patients shows a reduction in cerebral glucose utilization after administration of reserpine.

And at Ciba's (Summit, N.J.) laboratories, animal studies indicate that reserpine's tranquilizing action differs from that of commonly used sedatives such as barbiturates or bromides. Its most pronounced effects are on the autonomic nervous system.

- An increasing number and diversity of drugs are becoming available for studies of the central nervous system. Illustrating this trend is a new ganglionic blocking agent, chlorisondamine dimethochloride, investigated by Ciba's Jurg Schneider and Robert Moore, Jr. Their find: the compound is potent and long-lasting, has about twice the activity of pentapyrrolidinium and hexamethonium and several times the latter's duration of action.

- Other strides are being made (at National Institutes of Health, in

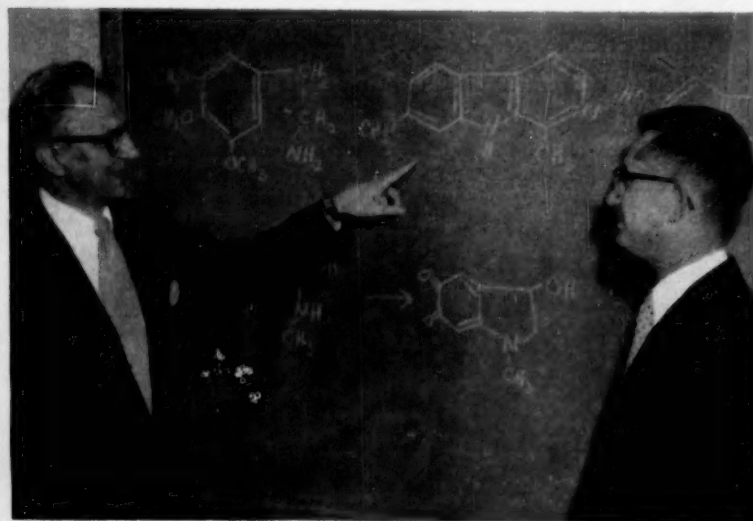
Story begins on p. 78 particular) in determining the effects of mental drugs on animal behavior. Object here is to determine the effects drugs will have on humans. Clear-cut correlations have not yet been achieved. But a mass of empirical data now being gathered is a step in the right direction.

Basic research in this regard follows several lines. The animal (with and without sedation) is given various emotional stresses and its physiological responses are recorded via electrocardiograms, electroencephalograms, body temperature measurements, etc. Or, the effects of drugs on its conditioned reflexes (to shock, food, etc.) can be observed.

- In the same vein, animal tests are contributing to greater knowledge of brain chemistry through studies of how the drugs: (1) satiate or deplete the brain of certain essential substances (e.g., serotonin); (2) act directly on the central nervous system and affect the higher psychic functions.

Although still largely rudimentary, it is giving rise to what is termed the theory of chemically induced behavioral change*—cornerstone of the potentially new science of "psychochemistry." The domain of psychochemistry today is largely veiled in darkness. But the relationship between chemistry and psychological processes is destined to become less of a mystery with each completed research step.

*Subject of a recent Battelle-Fels symposium.



KROPA (left) AND MORIN: In mescaline variants, hopeful antagonists.

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Gossamer Glass

Latest item on the glass insulation market is American Machine & Foundry's super-thin (0.0005 in.), porous, all-glass paper. Now in the evaluation stage, it may be the answer to electrical manufacturers' quest for a tissue-thin, temperature-resistant dielectric sheet (CW, Aug. 27, p. 43).

Made from microdiameter glass fibers (supplied by LOF Glass Fibers, Toledo, O.), the paper—called Tissuglas—reportedly is the thinnest glass paper commercially available—0.0005 in. vs. 0.002 in. for what is held to

be its closest competitor. Available in a pore-size range of 5-100 microns, it's said to withstand temperatures up to 700 C, and to have good dimensional and chemical stability.

Right now, biggest potential use is in jet aircraft and guided missile components. That's because at supersonic speeds, skin friction (which causes high ambient temperatures) is the design engineer's biggest worry; to reduce friction, electronic designers try to scale down equipment, need thin dielectrics (0.001 in. or less) able to withstand temperatures of 180 C and higher. It's in such applications

that Tissuglas is expected to find use.

AMF reports the material is available in lengths up to 1,000 ft., widths to 40 in. Also available are glass papers that range in thickness up to 0.013 in. Cost is expected to be the same as that of other commercial glass insulating papers—\$40/lb. and higher, depending upon thickness.

As cost decreases, glass paper insulators (made by several firms) can anticipate a \$4-million market in industrial equipment. Here, electrical equipment makers try to reduce size without sacrificing output. Reduced size, however, means increased heat, which, in turn, requires temperature-resistant dielectrics. Tissuglas—which may be saturated with varnish to increase its dielectric strength—hopes to garner a share of this market.

The glass sheets are also said to be suitable as filters:

- In analytical liquid filtrations where hot, corrosive slurries are used (H. Reeve Angel and other filter paper people tell *CW* that they have seen the material, believe it is too soon to express an opinion of its worth).

- In air filtrations where waste products are to be removed from gases.

With Tissuglas, AMF now becomes the third major producer of glass insulating papers. Others: Hurlbut Co. (South Lee, Mass.) and C. H. Dexter & Sons (Windsor Locks, Conn.). Both are thought to be researching comparably thin materials.

While it's too early to say whether Tissuglas is an answer to electrical equipment manufacturers' problems, its appearance will doubtless spur glass researchers in their search for superior high-temperature insulators.

• **Bond Former:** Peptide bond-forming *N,N*-dicyclohexycarbodiimide, used also in the synthesis of phosphate esters of nucleosides, is now available from Mann Research Laboratories, Inc. (New York) at a price reduction of 40%. Purity of the product has reportedly been improved to a 99.8% minimum.

• **Diffraction Data:** X-ray diffraction powder patterns for 45 substances, including stibnite, clausenthalite and hieratite, are included in a new publication, *Standard X-ray Diffraction*



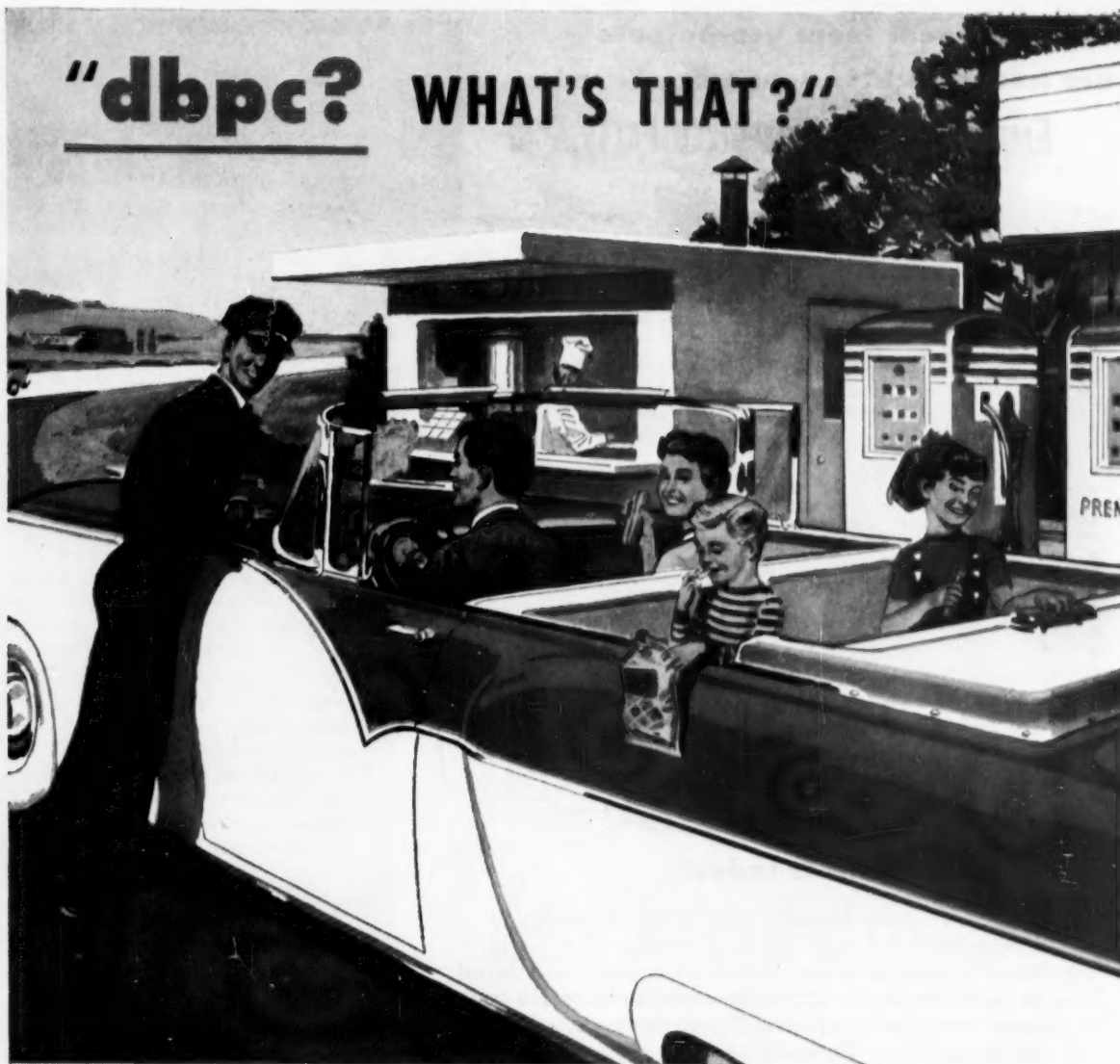
Mapping a Global Chore

NEWEST emissary for foreign research (CW, May 14, p. 48) is General Electric's George Szasz (right). Operating from GE's recently established European office in London, Szasz will travel throughout western Europe, attend scientific meetings and visit research laboratories.

Shown with GE's C. G. Suits,

vice-president and director of research, Szasz will be the firm's first scientific representative abroad. A native of Budapest, Hungary, he holds degrees from the University of Cincinnati and Pennsylvania State University, was formerly deputy scientific director of the London branch of the U.S. Office of Naval Research.

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ation. And even your wife's oil-based cosmetics such as lipstick and face cream depend on **dbpc** for protection against color and odor changes.

For more detailed answers to the interesting question, "What's **dbpc**?" write to Koppers Company, Inc., Chemical Division, Dept. CW-125, Pittsburgh 19, Pennsylvania.

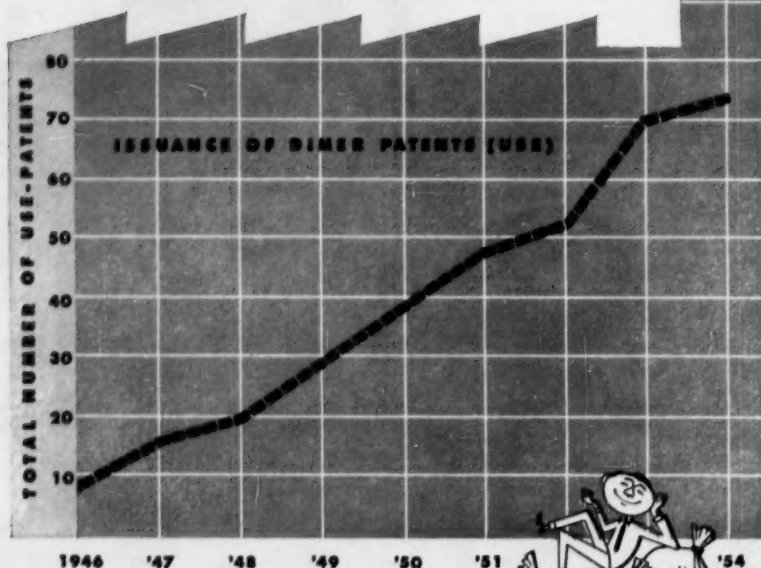


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RESEARCH

Powder Patterns, Circular 539, Volume V, by the U.S. Bureau of Standards' Howard Swanson, Nancy Gilfrich and George Ugrinic. The patterns are intended primarily for the identification of unknown crystalline materials, may be ordered from the Government Printing Office, Washington 25, D.C. Price: 45¢.

Slime Studies: Elimination of bacterial slime from pulp plant waste liquors is the object of new studies by Washington State Pollution Control Commission. Bacteriologist E. J. Ordal, University of Washington (Seattle), will head the project in co-operation with Crown Zellerbach Corp. (Camas).

Lab Lamp: A new laboratory lamp that supplies line spectra ranging from ultraviolet to near infrared is available from George W. Gates & Co., Inc. (Franklin Square, L.I., N.Y.). The lamp uses 12 bulbs—cadmium, calcium, helium, mercury, mercury-cadmium, potassium, sodium, neon, rubidium, thallium, zinc and mercury—interchangeably. Called the Spectral Omniorange Lamp, it features ease of handling and bulb changing.

Nuclear Offer: Hooker Electrochemical Co. (Niagara Falls) has reportedly pledged \$50,000 toward the University of Buffalo's proposed \$750,000 nuclear research center. James Evans, special assistant to the UB chancellor for the project, says the pledge is the first by a Niagara Frontier firm and is contingent upon raising the additional \$700,000.

Waste Lab: At the Atomic Energy Commission's Hanford plant, General Electric has put its new \$1.5-million water treatment laboratory into operation. Goal of the lab is to find economical ways of chemically treating Columbia River water so that it can be used to cool atomic reactors operating at higher power than at present. Sample studies: methods to decrease corrosion of reactor tubes and fuel elements by cooling water; ways to minimize the water's radioactive impurities. The lab will operate 24 hours/day, provide large-scale facilities for experiments in filtering and chemical treatment. Indoor and outdoor fish troughs and ponds will be used in reactor effluent testing.



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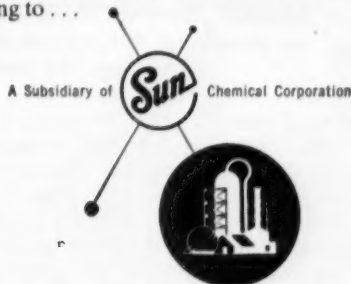
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MODERN METHOD: Headset-clad clerks and stock crew make Ciba's inventorying . . .

Cheaper by 'Phone

No tedious preparation, no frustrating stock hunting, no steep costs. That's what Ciba's inventory method offers.

Special closed circuits link warehouse with records at the office, help to streamline nuisance-ridden procedure.

"Inventory" has few equals when it comes to a word that evokes sheer dismay. Top executives and warehousemen alike detest the painstaking drudgery of this necessary practice. Not so, however, at Ciba Co. Inc. (New York)—U.S. headquarters for Ciba's dyestuffs, chemicals, and plastics.

Ciba now has itself a fresh new system that eliminates almost all preparation, overtime, and—most important—the traditional inventory headaches. What's more, the new approach makes a one-day job of inventorying six large floors, cuts taking costs better than 90%. Now proved in practice, the method is believed to be widely applicable.

Telephone communication is the key to the system, asserts Edward Rogers, marketing supervisor and deviser of Ciba's new method. By means of two specially installed closed circuits, warehousemen are connected with the central stock record desk clerks—both equipped with headset

'phone gear. The clerk establishes product identity by first receiving the product name, then checking a product number on the product card against one called by the stock counter. Next, he compares his total count of barrels shown on the card with that reported from the floor. If totals agree, the card is "closed out" with a red sticker.

After inventory, a punch card for each product is made from a master deck. The card contains product number, product name and concentration. To these data is added product weight. Value of the physical inventory results from processing the cards on the basis of normal cost. Regular inventory adjustment follows comparison of this value with one obtained by running the cards of the perpetual inventory.

To keep tab on the accuracy of the new method, special controls were devised. An ear-'phone-equipped auditor watched entry of called numbers. Later, auditors spot-checked products on the floors. A tape recorder took

down all conversation. And, following the actual taking, adding-machine totals of the stock card values were compared with totals produced from perpetual inventory records. Only seven errors cropped up in some 2,500 cards.

Now Obsolete: The new telephone method, Rogers explains, replaced a lengthy cumbersome system. Here, a *per diem* typist prepared a separate punch card for each barrel of each product. Cards were forwarded first to a coding section, which added unit cost per pound, next to a punching operation. But journey's end was still far away.

After punching, the cards were moved to the stock record desk for updating,* and subsequently on to the corresponding barrel in the stockroom. Several days prior to inventory, auditors spot-checked cards for the more costly products. On the dreaded day, the cards were removed, and a list including weight times value figures was calculated, sent to the stock record desk. Checking files against the list took a full week.

Benefits from Circuitry: It's clear that the new telephone technique yields many advantages:

- No advance preparation. Now

*Rogers estimates that one and one-half times more punch cards were made than the number of drums in the entire inventory.

Shipping chemicals



the hard way?



...use the easy
BULK way

If you're producing in carload capacities but shipping in smaller packaged quantities... if you're producing new chemicals that present new shipping problems... you're in a position to take advantage of clean, efficient, economical *bulk* shipping the North American way.

Let us look at your requirements. Let's get together and find out if your products can't be shipped better, safer and at lower cost by rail—in modern North American chemical cars *lined especially to your specifications*. We've been serving the chemical industry for years, and you'll find us helpful—*by the carload!*

NORTH AMERICAN CAR CORPORATION

NORTH WESTERN REFRIGERATOR LINE COMPANY

MATHER HUMANE STOCK TRANSPORTATION COMPANY

A NATIONWIDE ORGANIZATION WITH BRANCH OFFICES IN IMPORTANT MARKET CENTERS

231 South La Salle Street, Chicago 4, Illinois

Dallas • Fond du Lac • St. Paul • St. Louis • Tulsa • San Francisco • New York

there is no need to prepare separate cards, update them, place on barrels, collect, and check against the files. Preparation work in the warehouse (which took a "crew of about six men two overtime nights") can now be done in normal working hours a few weeks before inventory day.

- Reduction of work integration problems. No longer is it necessary to schedule overtime, mesh inventory preparation with a normal day's activities.

- Considerable cost savings. With the old system, cost of taking the inventory varied between \$2,500 and \$3,000. Now, Rogers figures, the expense is less than \$200—allowing for the 15-year amortization of the initial cost and installation of equipment of \$1,450 and all other costs.

- Nuisance elimination. By abolishing need of advance preparation, the problem of locating barrels for card-tagging has vanished. Because of constantly changing stock, this operation was a full-scale headache, often necessitated a check of original documents to determine disposition of "missing" barrels.

Drawback: Smooth as the inventory-by-phone method is, one drawback did rear up. Fatigue of the men at the stock record cabinet built up quickly as they pored over card after card, though spelling by a third man and plenty of hot coffee kept the procedure moving without hitch.

Well satisfied with its cost-snipping, time-whittling inventory method, Ciba will likely extend it to some of its larger branch warehouses. And improvements are coming: next year, the tape recording won't be made. Experience proved it unnecessary.

It's Rogers' contention that telephone inventorying can be adapted to many chemical and other stocks. All that's needed are a few private lines, extension cords for strategically located plug-in points in the warehouse, and a small capital outlay. From such an unpretentious arrangement, Ciba discovered, can stem appreciable savings in preparation, scheduling, worry, and cost.

- **Ready for Reference:** Carbide and Carbon Chemicals Co. (New York) is issuing two new product bulletins—epichlorhydrin and isopropyl ether. Reaction, end-use application, azeotropic data are included.



HIGH INTEREST: Contest attracted crowds at exposition, was a . . .

Multipurpose Promotion

Promotion with a twist evoked heaps of interest in Victor Chemical's (Chicago) booth at the Exposition of Chemical Industries in Philadelphia last week. Basis of the gimmick: a contest for spectators to rate Victor's advertisements. Winners will receive prizes ranging from a popular-make 1956 station wagon to a complete spinning-tackle outfit.

For Victor, the contest serves several ends. Besides adding an intriguing touch to the exhibit (most such contests are less ambitious in scope), it provides intensive, wide readership of ads, puts them into wide circulation.

Mechanics of the contest are simple. Visitors to the booth were offered a "wallet" (pocket-size) containing reproductions of the eight ads—covering the entire line of Victor products—plus cooperative advertisements describing the seven prizes. Entrants signed up on the spot, although they don't become contestants until their appraisals are submitted.

To judge the contest quantitatively, Victor will count the number of inquiries resulting from the original couponed ads, will compare them with ratings submitted by contestants. Contestants' entries will be tabulated and validated by means of identifying coupons at the bottom (which, incidentally, will go onto a mailing list). In January, Victor will have the final inquiry ratings elicited by the ads.

Many contestants took the wallet material away with them to mull over in the two weeks before the Dec. 24 entry deadline. Since the possible combinations of sequences add up to better than 40,000, Victor figures most contestants prefer to give extended thought to the problem.

Winners will be announced by letters to all entrants. Reuben H. Donnelley Corp. will count votes.

When all is said and done, Victor will have put its ads through many paces, hopes to have earned much from its multipurpose promotion.

STEPAN



Dimethyl Sulfoxide

A most unusual **NEW** Solvent...

Potential uses

- ◆ **Solvent for acetylene** ... absorbs 32% more acetylene than acetone ... many times longer life in acetylene cylinders.
- ◆ **Selective separation of paraffinic and aromatic hydrocarbon mixtures.** Also for desulfurization of gasolines.
- ◆ **Solvent for certain synthetic fibres** such as polyacrylonitrile and acetate rayon as well as others.
- ◆ **As anti-freeze** or hydraulic fluid when mixed with water. (Offers possible cost savings.)
- ◆ **As paint and varnish remover.** Also nail polish remover.
- ◆ **Possibly useful as diesel fuel additive.** (Raises cetane number.)

Write For Complete Information

STEPAN

Physical Properties

Dimethyl Sulfoxide

Molecular weight	78				
Melting point	18.45°C (supercools easily)				
Boiling point (760 mm)	189°C				
Spec. gravity (20°C)	1.100				
Refractive index (n _D ²¹)	1.4787				
Vapor pressure	at	20°	30°	47.4°	56.6°
	mm	.37	.79	2.82	5.11
Viscosity 27°C	1.98 cps				
Specific heat	.5 cal/g as solid				
	.7 cal/g as liquid				
Heat of vaporization	ca 175 cal/g				
Heat of solution	60 cal/g				
Heat of fusion	20 cal/g				
Heat of combustion	6050 cal/g				
Flash point (°C)	95° (open cup)				
Coefficient of expansion	.00088				
Dielectric constant	45				

CHEMICAL COMPANY

20 North Wacker Drive, Chicago 6, Illinois

Telephone: CEntral 6-5511

FATTY ALCOHOL SULFATES • BULK LIQUID DETERGENTS • SULFONATED OILS • AMIDES • FOAM STABILIZERS • ALKYLPHENOL POLYALKOXY SULFATES



BOOK PHOTO

Closeup on Goodwill

AT YEAR'S END, Smith, Kline & French Laboratories' (Philadelphia) mobile color-TV unit will have completed its best year—with 15 broadcasts of medical clinics and surgical operations. Total since start of operations in 1949: 1,135 clinics, 706 surgeries, 896 broadcast hours, comprising 81 separate telecasts.

Most recent show was the clinical session of the American Medical Assn. in Boston, seen simultaneously over closed circuits in 34 cities.

Purpose of the quarter-million-

dollar unit is to enlist the goodwill of physicians, prescribers of S,K&F's ethical pharmaceuticals. That viewers are enthusiastic is shown by the unit's sustained popularity: the company has to turn down 20-30 requests a year. Thus far, there have been 390,000 doctor-visits made to broadcasts, a figure equivalent to more than two visits for every U.S. physician. Median broadcasts last about eight hours.

To meet the demands for this demonstrative medium requires 10 tons of TV equipment (*below,*

left), a 32-ft. moving van, 11 staff people and a budget of \$200,000/year. Included in S,K&F's inventory:

- Two studio-type color cameras.
- A closeup, boom-type camera.
- Monitoring and control equipment.
- Specialized equipment such as microphones, low-heat lighting.
- Two screen-projection-type receivers and two 4½x6 ft. screens. Each of the latter can accommodate as many as 900 viewers (*below, right*), although S,K&F usually seats about 600 before each one.

Generally, doctors and surgeons are cooperative, even enthusiastic. Color-TV cameras at the operating table (*above*) can unobtrusively get unrestricted views through the cluster of people around a table. Viewers get a better view of what's going on than in the traditional amphitheatre where attendants get in the way. Moreover, magnifications possible with closeup lenses permit easy identification of physical parts.

Smith, Kline & French considers the venture highly successful, feels it has created wide respect for the company among physicians. From the looks of its 1956 schedule, bulging with 10 shows for next spring alone, the unit is decidedly a going promotional concern.



BOOK PHOTO

**Sodium
Polyphos**

SODIUM HEXAMETAPHOSPHATE
SODIUM TETRAPHOSPHATE

**Trisodium
Phosphate
Chlorinated**

**Tetrasodium
Pyro
Phosphate**

**Trisodium
Phosphate**
CRYSTALLINE
MONOHYDRATE

Sodium

**Sodium
Tripoly
Phosphate**



BLOCKSON

**BLOCKSON
CHEMICAL
COMPANY**

Division of Olin Mathieson
Chemical Corporation

JOLIET, ILLINOIS

Phosphates

**Disodium
Phosphate**

ANHYDROUS
CRYSTALLINE

**Monosodium
Phosphate**

ANHYDROUS
MONOHYDRATE

**Sodium Acid
Pyro
Phosphate**

also major
producers of:

**SODIUM
SILICOFLUORIDE**

SODIUM FLUORIDE

**HYGRADE
FERTILIZER**



FOR THESE SYMBOLS OF QUALITY



STOCK POINTS

Seattle
Portland
Sacramento
San Francisco
Fresno
Los Angeles
Houston
Dallas



STOCK POINTS

Boston
Detroit
New York
Philadelphia
Chicago
Baltimore
Norfolk
Savannah
New Orleans

These stock points are your assurance of quality materials . . .
When you want them . . . where you want them . . .

**TRICHLOROETHYLENE
SODIUM BICARBONATE**

USP & Technical

Sodium Cyanide
Potassium Cyanide
Sodium Aluminate Dry
Calcium Formate

**UREA TECHNICAL 46%
ALUMINUM SULPHATE 17%**

Iron Free

Ammonium Bicarbonate
Ammonium Chloride
Ammonium Alum
Bleaching Powder Tropical 35-37%

LCL quantities available from Distributor Stocks in your area
This is only a partial listing of the items we offer. Write for complete product listings.

Chemical Manufacturing Co., Inc.

444 MADISON AVE., NEW YORK 22, N. Y.

LOS ANGELES

SAN FRANCISCO



Imperial Chemical Industries Limited



Peter Spence & Sons Limited

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OR ESTATE PLANNING**

WE do all types of corporate financing for growing businesses.

WE arrange long and short term loans with lending institutions.

WE underwrite the sale of bonds, preferred and common stock to the public in general.

WE arrange for the sale of bonds, preferred and common stock to select groups on a "private placement" basis.

WE arrange the transfer of entire businesses for cash or on a "tax-free" exchange basis.

WE sell plants on a lease-back basis.

WE have been successful in selling minority interests for owners of substantial businesses with estate planning problems.

WE have had broad experience in determining the most economical method of financing consistent with corporate dignity, credit considerations and status in the industrial and financial community.

WE shall be glad to discuss your problem without obligation.

SCHUSTER & CO., INC.

SECURITIES UNDERWRITERS

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DISTRIBUTION



KICKOFF: The first—of thousands more to come—starts* its circulation.

100,000 Salesmen

When Mr. Average Citizen thumbs through a copy of Pfizer's latest book, he'll learn that fermentation is a key industrial process. And at the same time, the odds are that he'll link Pfizer and fermentation—particularly antibiotics—from then on.

Slick, hard-covered, and with a novel die cutout insert of a mold photo, the 32-p. book traces the history of fermentation, describes modern applications. Although Pfizer's name is not prominently displayed, its role in developing fermentation is by no means slighted.

Aiming for subtle promotion (tying Pfizer with fermentation) and public cognizance of the process, the company will put the book in at least 100,000 places where it hopes it will do the most good. On the mailing list: municipal, high school, university and medical libraries; graduating classes of physicians, veterinarians, dentists, pharmacists and osteopaths; government officials; heads of college departments of chemistry, biology, and pharmacy; stockholders, and others. A second printing may be necessary. Foreign language editions are likely.

Readers today may be fermentation product buyers tomorrow—and it's Pfizer's idea that they should know more about the process.

*Pfizer President John McKeen (right) hands first copy of fermentation book to Columbia University's Dean of Pharmacy, Dr. E. Emerson Leuallen.

NEW CHEMICAL HORIZONS



FPG

TARSET®—

Revolutionary New Corrosion Fighter for the Oil Industry



NOW, for the first time—the nation's vital petroleum industry is able to protect its costly producing and storage equipment with an economical, easily applied protective coating which withstands severest corrosion attack.

This revolutionary new corrosion fighter is Pitt Chem Tarset, a unique combination of two *proven* protective agents—coal tar and epoxy resin. It is the toughest, hardest coating of its type every produced from coal tar.

Because of its amazing ability to withstand sulphur compounds and

brine found in crude oil, a large part of our initial production of Tarset has been earmarked for interior protection of crude oil storage tanks and experimental use in oil well casing.

However, as production increases, larger quantities are being made available for other vital applications. For example, tests indicate that Tarset is immune to attack from diesel fuel, aviation gasoline and jet fuel. It appears equally resistant against corrosive chemicals such as hydrochloric acid, sodium hydroxide and salt solutions.

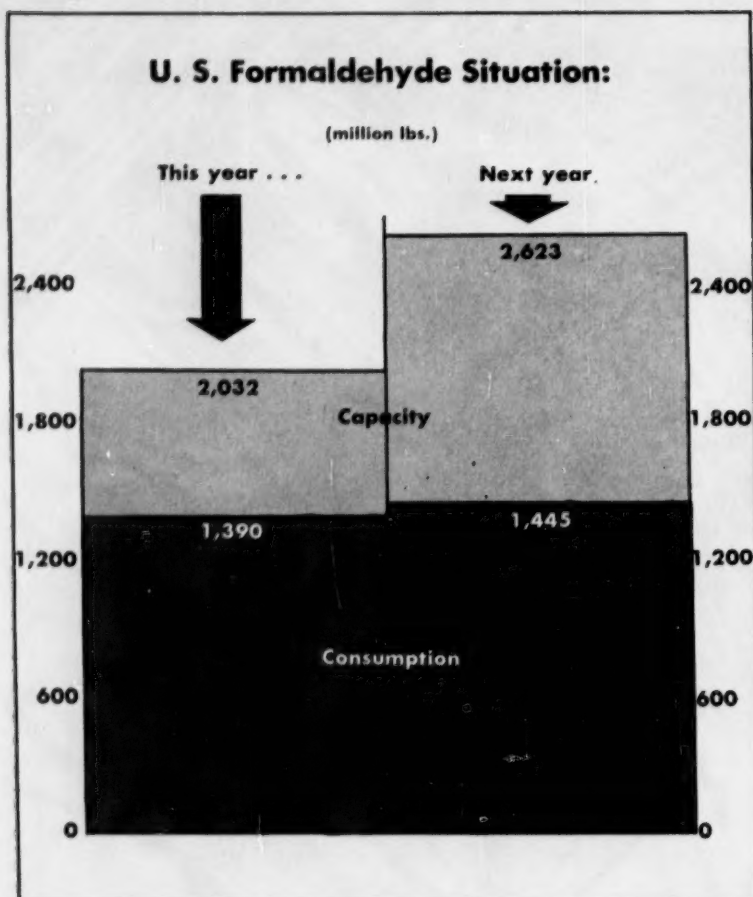
Subjected to temperatures as high as 400°F., Tarset actually becomes *harder* instead of softer, as most coatings of

this type do! And it can be economically applied by brush, spray or roller.

Creating protective coatings to extend the life of industry's capital equipment is one more way in which Pittsburgh Coke & Chemical provides you with better products . . . *through research.*



COAL CHEMICALS • AGRICULTURAL CHEMICALS • FINE CHEMICALS • PROTECTIVE COATINGS • PLASTICIZERS • ACTIVATED CARBON • COKE • CEMENT • PIG IRON



Formalin Steps Up—Again

U.S. formaldehyde capacity will increase by some 600 million lbs. next year, reach an impressive 2.5 billion lbs./year.

Although consumption will likely lag by nearly a billion pounds, producers show little concern as new plants pop up.

Within the last week or two, formaldehyde has become a hot topic of conversation among chemical marketers. Reason: a current stringent market condition, coupled with sudden realization that total productive capacity in this country, by the end of next year, will step up nearly 600 million lbs., check out '56 at something over 2.5 billion lbs.

Firing the burst of renewed interest are several fast-breaking developments:

- For the first time, Merck, early next year, will aim formaldehyde toward nongovernment outlets.

- Late in '56, the Chemical Division of Borden will double its West Coast output of formaldehyde with a new 36-million-lbs./year Seattle plant.

- Slated for midyear operation is Hercules Powder's now-building Louisiana, Mo., formaldehyde installation. Likely output: 100 million lbs./year.

- Now definitely planned, the long-rumored Reichhold Chemicals expansion at Kansas City, Kan., which will produce 23-25 million lbs./year of formaldehyde.

Add, too, the somewhat unexpected entry on the lengthening list (see p.

96) of U.S. formaldehyde facilities—Commercial Solvents' more-than-probable unit at Sterlington, La.

Official announcement may not be imminent but *CW* learns that bulk (eventually as much as two-thirds) of the formaldehyde to be made at the nitroparaffin site will be shipped to General Aniline & Film's acetylene derivatives venture at Calvert City, Ky.

Into Trade Channels: The Merck move into formaldehyde marketing is an indirect result of the Korean War. During that period—and until recently—the company operated the Cherokee plant at Danville primarily to fill government orders for hexamethylenetetramine (hexamine), an intermediate for the explosive RDX.

Formaldehyde take for production of hexamine during '53 hit a peak of near 225 million lbs. Today practically no hexamine is explosively used. Consequently, the formalin need has dwindled since hexamine requirements for resin manufacture are also comparatively small. Fact is, this outlet next year may take only 60-65 million lbs. of formaldehyde (see *end-use pattern*, p. 98).

Capacity of the Danville formaldehyde plant, said to be the biggest in the world, is rated at about 400 million lbs./year. Actually, Merck will reactivate about half that potential, although the mothballed units could be whipped into use within two or three months if the need developed.

Few trade observers believe, however, that Merck's formaldehyde sales will go beyond 50-60 million lbs., at least for some months.

Upping Demand: Borden's expansion on the West Coast is tied directly to the increasing need for formaldehyde in the plywood and adhesives industries. The new Seattle installation (which will produce 44% material) will supplement output from the firm's Springfield, Ore., plant.

The formaldehyde expansion at Seattle—the present plant there now produces dry adhesives for plywood—will, says Borden, put the company in a position to serve the entire Pacific Coast area from western Canada to San Francisco.

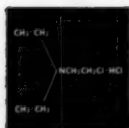
Another established formalin use, production of pentaerythritol, is behind Hercules Powder's upcoming ex-

specially prepared

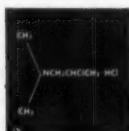
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DIALKYL AMINO ALKYL CHLORIDES provide a versatile group of intermediates for pharmaceutical synthesis. Continuously produced by Michigan Chemical Corporation for many years, individual members of this intermediates family provide manufacturers with a convenient method for introducing the dialkyl amino alkyl radical into organic nuclei to produce substituted amines, esters, and ethers. All are available in commercial quantities. Write for samples, technical data, and prices.

for pharmaceutical synthesis



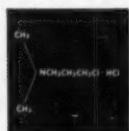
beta-Diethylaminoethyl Chloride Hydrochloride. (DEC). $(\text{CH}_3\text{CH}_2)_2\text{NCH}_2\text{CH}_2\text{Cl}$. HCl. A granular solid. Specially suited for use as an intermediate in organic chemical manufacture, including the production of antispasmodic agents and other pharmaceuticals.



beta-Dimethylaminoisopropyl Chloride Hydrochloride. (DMIC). $(\text{CH}_3)_2\text{NCH}_2\text{CH}(\text{CH}_3)\text{CH}_2\text{Cl}$. HCl. (DMIC). An organic intermediate similar in appearance and properties to DEC and DMC. Specially prepared for manufacture of analgesics and other pharmaceuticals. Other potential uses in organic synthesis.



beta-Dimethylaminoethyl Chloride Hydrochloride. (DMC). $(\text{CH}_3)_2\text{NCH}_2\text{CH}_2\text{Cl}$. HCl. A granular solid. Specially prepared for use in manufacture of antihistaminics and other pharmaceuticals. Other potential uses in organic synthesis. Relatively non-toxic in hydrochloride form.



gamma-Dimethylaminopropyl Chloride Hydrochloride. (DMPC). $(\text{CH}_3)_2\text{NCH}_2\text{CH}_2\text{CH}_2\text{Cl}$. HCl. (DMPC). A white powder of singular purity. A versatile intermediate for pharmaceutical and organic syntheses, available exclusively from Michigan Chemical.



Other widely used intermediates supplied by Michigan Chemical Corporation include Hydrobromic Acid, Methyl Bromide, Ethyl Bromide, Monobromobenzene, Trimethylene Chlorobromide, Phosphorous Tribromide and Cyclopentyl Bromide. Write for booklet "Individualized Intermediates."

MICHIGAN CHEMICAL CORPORATION

*Trademark

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EASTERN SALES OFFICE: 230 Park Avenue, New York 17, New York

BASIC MANUFACTURER OF INDUSTRIAL, PHARMACEUTICAL AND AGRICULTURAL CHEMICALS

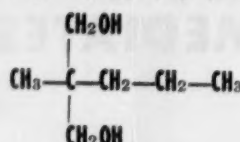
December 17, 1955 • Chemical Week

95

Now Available In
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2-methyl-2-n-propyl-1,3-propanediol



Our facilities are available for this and other intermediates specifically required for your purposes. Write, wire or phone for details.

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The tragic fact, our doctors tell us, is that every third cancer death is a needless death... twice as many could be saved.



LET'S LOOK AT THE BRIGHTER SIDE

Many thousands of Americans are cured of cancer every year. More and more people are going to their doctors in time... To learn how to head off cancer, call the American Cancer Society or write to "Cancer" in care of your local Post Office.

American Cancer Society

MARKETS

MAJOR FORMALDEHYDE PRODUCERS:

Who:	Where:	How Much: (est. million lbs./year)
Allied Chemical & Dye	Southpoint, O.	200
Bakelite	Boundbrook, N.J.	160
Borden	Bainbridge, N.Y.	24
	Demopolis, Ala.	36
	Seattle, Wash.	36*
	Springfield, Ore.	24
Celanese	Bishop, Tex.	235
Cities Service	Tallant, Okla.	20
Commercial Solvents	Agnew, Calif.	15
	Sterlington, La.	30*
Du Pont	Belle, W. Va.	235
	Perth Amboy, N.J.	150
	Toledo, O.	73
Durez	North Tonawanda, N.Y.	90
Heyden	Fords, N.J.	60
	Garfield, N.J.	170
Hercules Powder	Louisiana, Mo.	100*
Kay-Fries	West Haverstraw, N.Y.	20
Merek	Danville, Pa.	400*
Monsanto	Springfield, Mass.	160
Olin Mathieson	Morgantown, W. Va.	50
Reichhold Chemicals	Ballard Vale, Mass.	25
	Charlotte, N.C.	30
	Kansas City, Kan.	25*
	Seattle, Wash.	26
	Tuscaloosa, Ala.	30
Rohm & Haas	Bristol, Pa.	25
	Bridensburg, Pa.	25
Spencer	Calumet City, Ill.	42
Trojan Powder	Seiple, Pa.	40
Warren Petroleum	Conroe, Tex.	12

Total 2,568

*For 1956.

pansion at Louisiana, Mo. There may be a question whether or not all the planned U.S. PE capacity will soon be needed (*CW*, Sept. 10, p. 93), but there's no disputing the alkyd-type resin raw material's importance as a formaldehyde user.

Next year, for instance, PE production in the U.S. should take some 335 million lbs. of formalin; and that's an increase of more than 100 million lbs. over PE formaldehyde requirements of four or five years ago.

Talk of Reichhold Chemicals formaldehyde expansion at Kansas City has been bruited about—and discounted—for months. Speculation also popped up, while the abortive merger discussions were going on between Reichhold and Catalin, that the former would acquire Spencer's Calumet City, Ill., formaldehyde plant.

This was denied, of course, and

further squelching the rumor is Reichhold's insistence, in the face of oft-heard skeptical comments, that plans are well along and formaldehyde production rate at Kansas City, by the end of next year, will be close to 25 million lbs./year.

Reichhold's Ballard Vale, Mass., plant (currently turning out about 18 million lbs./year of formaldehyde) will also get a boost in capacity. Equipment going in during '56 will raise the rate to 30 million lbs./year.

These, plus other possible expansions in the field, will jack total U.S. formaldehyde capacity to an estimated 2,568 million lbs. next year. Compare that with the reported 980-million-lb. capacity in this country as recently as 1950.

Formaldehyde capacity has over the years consistently paced production. But invariably as the gap be-



Dependable Source for Chemical Raw Materials



Discussing Dover's expansion plans are, left to right: Samuel R. Thrush, plant manager; Eric R. Beu, chief process engineer; and Robert S. Cohen, president.

"Wyandotte is one of the most customer-conscious suppliers we have dealt with"

—Robert S. Cohen, president, Dover Chemical Corporation, Dover, Ohio

The Dover Chemical Corporation started out in 1949 manufacturing one grade of chlorinated paraffin. Today it is an important producer of chlorinated paraffins, with eight grades varying in chlorine content from 30 to 70 per cent.

Dover's chlorinated paraffins find their way into many industries. They are used in the manufacture of cutting oils, as additives for lubricants, as flame-proofing components in paints and polyester resins, and as co-plasticizers in vinyl resins — to name just a few.

Other products which have been added recently include ortho-dichlorobenzene, used as a solvent in engine-cleaning compounds and in sewage treatment, and para-dichlorobenzene for use in moth balls and deodorants.

In order to better serve these varied markets, Dover looks to companies like Wyandotte for technical assistance. In the words of Robert S. Cohen,

Dover's energetic president: "Wyandotte's service and technical advice have been very valuable to us. At the present time, we are engaged in an expansion which will add several entirely different products to our line, and based on past performance, we know we can depend on Wyandotte's representative to get technical service to us promptly when we need it.

"When we order Wyandotte Chlorine, we can be sure that it will be delivered on time. Delivery is so dependable that we have come to take it for granted."

Are you looking for a reliable source for chemical raw materials... a source with a background of years of experience in many industries?

If you are, you'll find the people at Wyandotte good people to do business with. You'll like the consistently uniform quality of Wyandotte's products,

and the dependability and scope of Wyandotte's service.

Why not talk over your requirements with a Wyandotte representative? Or write us, giving as many details as possible about your uses for chemical raw materials. *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Offices in principal cities.*



Wyandotte CHEMICALS

HEADQUARTERS FOR ALKALIES

Soda Ash • Caustic Soda • Bicarbonate of Soda • Chlorine
Muriatic Acid • Calcium Carbonate • Calcium Chloride
Glycols • Chlorinated Solvents • Synthetic Detergents
Other Organic and Inorganic Chemicals

Borates

*in every form...
for every use...
from
one source!*

When You Want Boron Tri-oxide—Look to Pacific Coast Borax Co. first for the particular boron product you require. Here is widest diversification of B_2O_3 sources... borates, concentrates, and ores. Here is every facility—from mine to refinery—to satisfy your needs. Our research chemists and technically-trained sales staff will gladly assist you to determine the product most suitable.

NEW YORK • CHICAGO • CLEVELAND • PHILADELPHIA • LOS ANGELES

CHECK THE PRODUCTS OF INTEREST TO YOU

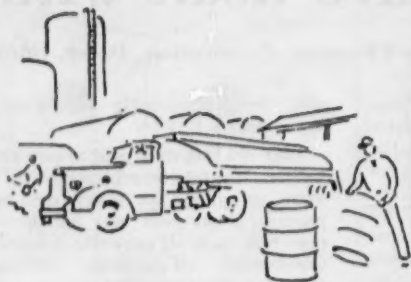
- ☐ BORAX
Technical and U.S.P.
- ☐ BORIC ACID
Technical and U.S.P.
- ☐ BORAX 5 MOL
- ☐ ANHYDROUS BORAX
- ☐ BORAX GLASS
- ☐ AMMONIUM BIBORATE
- ☐ AMMONIUM PENTABORATE
- ☐ POTASSIUM TETRABORATE
- ☐ POTASSIUM PENTABORATE
- ☐ SODIUM METABORATE
- ☐ SODIUM PENTABORATE
- ☐ ANHYDROUS RASORITE
- ☐ RASORITE SPECIAL CONCENTRATES
- ☐ COLEMANITE (Ore)
- ☐ GERTSLEY BORATE (Ore)

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**Benzol — Toluol — Xylol
Super Hi-Flash Naphtha
"Amsco-Solv"™ Intermediate
Aromatics**

ALCOHOLS
KETONES
ESTERS
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PLASTICIZERS
CHLORINATED
SOLVENTS
GLYCOLS
AMINES
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MARKETS

tween the two narrows, new plants are constructed to meet the growing demand. The reason: about half of the formaldehyde produced is captively consumed. The economics of formaldehyde manufacture are such that when a supply/demand pinch appears inevitable, producers will install new facilities; but the expansions will increase capacity far in excess of immediate needs. This is not considered in the industry as extravagance, but rather as insurance against the continued needs for formaldehyde.

And more formaldehyde will be needed. Some aver that the resin material is just now approaching its steepest rate of growth. Why? Up-trending plastics. Formaldehyde resins—particularly phenolic, urea and

Formaldehyde End-Use Pattern 1956

(million lbs.)

Phenolics	360
Ureas	330
Melamines	90
Pentaerythritol	335
Hexamine	65
Glycol	220*
Other (textiles, leather, hexachlorophene, etc.)	45
	1,445

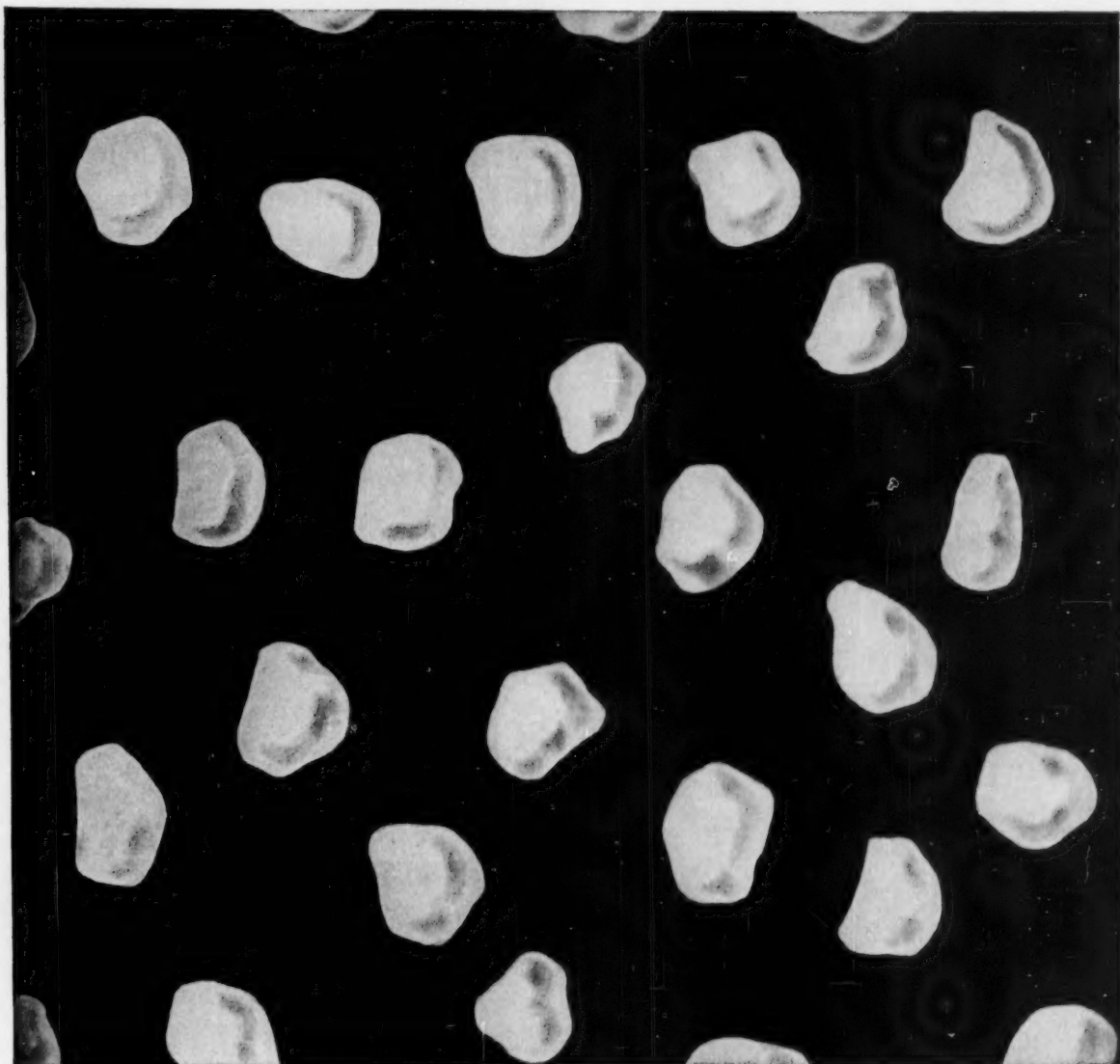
*Formalin use in glycol not reported by
Tariff Commission.

melamine—give little indication of slackening. Formalin consumption for each of the three types during '56 may well be 65-70% greater than it was, say, back in 1952.

Adding formaldehyde use in other widening outlets (antifreeze glycol, textile chemicals, sequestering agents, etc.) brings next year's consumption total to an estimated 1.5 billion lbs.

Matching that amount against the expected capacity total (over 2.5 billion) gives a probable overage of nearly 1 billion lbs.—enough to stagger producers of most other chemicals. But formaldehyde makers show little concern, tend to agree with the recent Paley Commission survey on the outlook for formaldehyde.

In 20 years, indicates the report, formaldehyde usage will dwarf current plant capacity, boom to a towering 8 billion lbs./year.



How to control particle distribution

In paint and plastics manufacturing—in emulsion polymerization—Du Pont surface active agents are proving to be ideal emulsifiers for these systems. These specialized agents help to increase rate of polymerization and assist in maintaining uniformity of size and distribution of the particles. They do not discolor the emulsion and give *reproducible* results.

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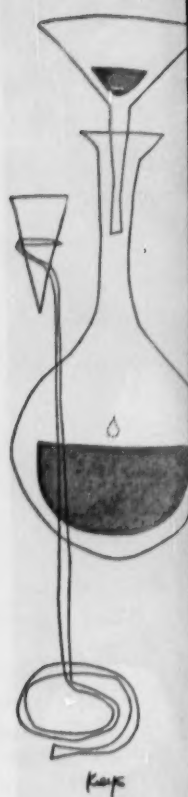
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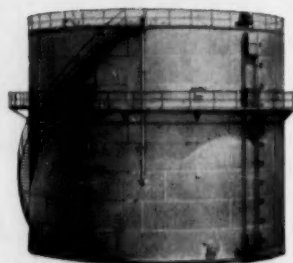


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Market Newsletter

CHEMICAL WEEK

DECEMBER 17, 1955

Marketplace movement of most chemicals, now zipping along at a lively pace, isn't expected to slacken soon. Momentum alone, say the bustling sellers, is strong enough to keep business brisk right through the first half of '56 at least.

Take cresylic acid, for example. Production, at close-to-capacity for months, is still inadequate to fill all customer orders promptly. Supply of some low-boiling grades, particularly, is quite tight in a few sections of the country.

Fact is, with demand for cresylic resins manufacture, tricresyl phosphate and other outlets likely to remain insistent, chances are that users will be paying more for their needs. Hike may come soon after the turn of the new year.

Same sort of situation prevails in cresols. Consumers have been buying heavily for many months, and few observers envision any immediate letup, especially in sales of meta-para fractions.

Step-up in foreign consumption, too, is compounding the domestic market tightness. Reason: use of cresols there is slicing imports here. Note this just-out seven-month government comparison of meta-para cresol importation: for the current calendar year, 52,000 lbs.; in '54, 130,000.

Titanium dioxide supplies are still stringent, but as was expected (*CW Market Newsletter*, Nov. 19), succor is in sight for strapped pigment consumers.

American Cyanamid's new 24,000-tons/year plant at Savannah, Ga., is in now (*see p. 16*), and, within the first quarter of '56, expansions by Glidden (at Baltimore) and Titanium Pigments (St. Louis, Mo.) will be operating.

The latter will up its capacity by some 36,000 tons/year, but Glidden is holding its figures close to the chest. Trade "guesstimators," however, peg the Baltimore increase at about 20,000 tons/year.

Also underscoring the expectation that titanium dioxide will continue hot are Du Pont's fast-stepping expansion plans. Although the first announced capacity increase at its Edge Moor, Del., installation won't be in until the fall of next year, the company has announced a second expansion there as well as at Baltimore. The latter two will be completed in 1957 and, with the first, will increase Du Pont capacity by more than 25%.

In addition, longer-range plans call for a new dioxide plant—near New Johnsonville, Tenn.—with a '58 start-up date.

Butadiene from alcohol is hitting the market again. Cost of the alcohol-base material runs higher than that from petroleum, but producers may have to buy more of the former to meet pressing butadiene requirements.

Production from Publicker's sole operating butadiene unit at Louisville, Ky., is sold out through '56, and the company is pondering advisability of starting up another. Calls from possible customers will determine the decision.

More such butadiene, however, could mean a pinch later on in alcohol availability. That would add to consumers' latest woe—the 2¢/gal. increase in ethanol prices slated to go into effect Jan. 1.

Market Newsletter

(Continued)

Also anent price advances due next month, you can add a couple more to the string of solvents mentioned here last week. Carbide and Carbon customers will get word that methyl amyl alcohol and methol amyl acetate will be upped $\frac{1}{2}$ ¢/lb.

New delivered price on both: 13¢/lb. (tank cars).

The same company has boosted its triethylene tetramine schedules 2¢/lb. straight down the line. This will be in addition to an earlier (*CW Market Newsletter*, Sept. 17) $\frac{1}{2}$ ¢/lb. increase in c.l. and l.c.l. prices brought about by higher drum costs.

Reason behind the new tetramine tags (tanks, 49¢/lb.; c.l. 51¢; l.c.l., 52¢/lb.) has a familiar ring these days—"due to increases in manufacturing costs. . ."

Look for a run of generally higher export quotes on caustic soda. Some dealers are already asking 20-30¢/cwt. above previous f.a.s. schedules (\$2.95 to \$3.05) on the strength of reports that most producers' export prices will go up Jan. 1.

The situation emphasizes the current snug domestic market position of caustic. Demand from major outlets, including rayon, chemical processing, textiles, cellophane, has been well sustained—even after posting of higher fourth-quarter prices on caustic—and movement should continue at a heartening pace.

An additional domestic price revision, though, is probably more moot than imminent, for caustic capacity is ample and additional installations are due in soon.

Tertiary-butylamine breaks into the market news again this week—and it's a break for present as well as potential consumers. Hard on the heels of the announcement that Monsanto was just about ready to undertake commercial-scale production comes word that Rohm & Haas will immediately slash prices by some 20¢/lb.

The newer entrant hasn't said yet, but it's likely that Monsanto will have to alter its previous pricing plans.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending December 12, 1955

UP

	Change	New Price
Sodium stannate, dms., wks., frt. all'd., E.	\$ 0.032	\$ 0.616
Stannic chloride, anhyd., dms., wks.	0.033	0.832
Tin, metal, Straits	0.066	1.09
Triethylene tetramine, tks., div'd. E.	0.02	0.49

DOWN

Reserpine, cryst., bots., gm.	\$ 1.00	\$ 8.00
Tallow, inedible, extra, tks., div'd.	0.0025	0.08
Tertiary-butylamine, c.l., dms.	0.20	0.47

All prices per pound unless quantity is stated.

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Back in 1821, Pierre Berthier of the French Royal Corps of Mines, according to legend, was strolling in the hills around the village of Les Baux (Bouches du Rhone), France. His companion stained her white dress with material from the surrounding rocks.

Upon learning the young lady was having difficulty removing the stain, Berthier collected samples of the rocks of Les Baux. When he analyzed the ore he found it contained 52.0% alumina, 27.6% ferric oxide, and 20.4% combined water. This was the first official recognition given to the deposit. Later, the ore was named "Bauxite" from its association with the near-by village of Les Baux.

Since this discovery, other deposits of bauxite have been found in several parts of the world. In addition to being the basic raw material of the world's aluminum industry today, bauxite is also an important raw material used by the chemical industry and for the production of abrasives, refractories and ceramics.

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Aluminum Chemicals

December 17, 1955 • Chemical Week

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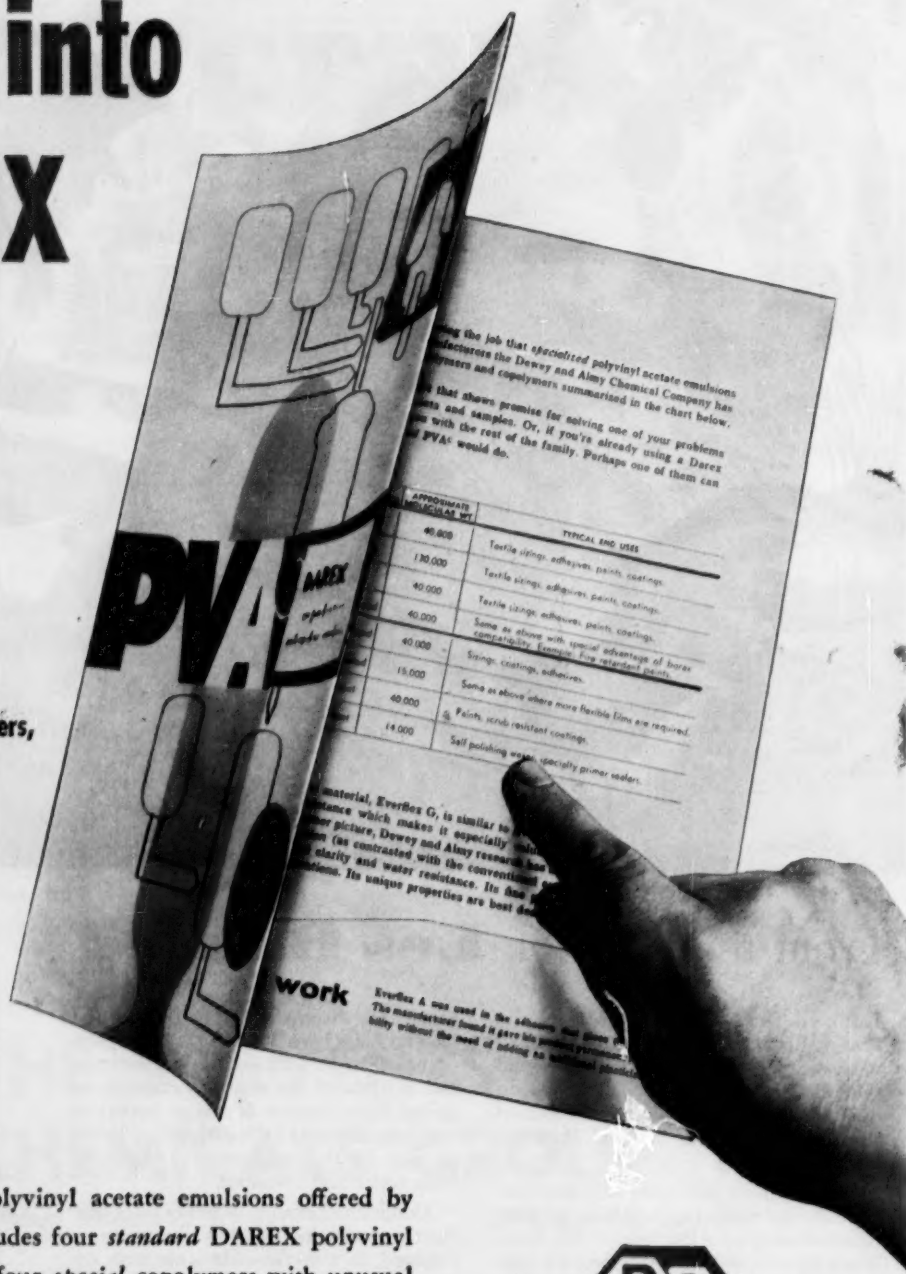
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CSMA: New Leadership, New Ideas

Stuff about 800 specialties makers under a single hotel roof, and you're bound to generate a certain amount of excitement. The 42nd annual meeting of the Chemical Specialties Manufacturers' Assn. at the Roosevelt in New York last week was no exception.

It was standing room only at several of the section meetings where discussion of new products and ideas vied for attention with symposia and presentation of research data.

Some of the latest ideas:

- Trichloroisocyanuric acid, newest entry in the competition among raw materials for dry bleaches, was plumped for by Monsanto. Now available in substantial quantities, it is for heavy-duty bleaches, and is expected to appear in several household products within a few months. It will also be pushed for industrial sanitizing compounds.

- Nonmetallic patching kits for automobiles — for professional use now, but easily adapted for do-it-yourselfers — were outlined by General Motors. GM is now supplying its dealers with large-size kits making use of epoxy resins, hardener, fiberglass cloth and chopped fibers, and silica fillers. Similar in many ways to the polyester repair kits devised for the Chevrolet Corvette, the epoxy provides a more secure, long-lasting bond to metals, and could well replace the solder-and-sander repairs that are used in most body shops. GM assembles its own repair units; the market for consumer-use products seems worth investigating.

- The Air Forces Air Research and Development Command described its work with new fungicides, which may soon be giving the copper compounds a real run for their money. Antibiotics turned out well: Endomycin was the most promising of a group that included benzyl muchochlorate, rimocidin, comirin, netropsin sulfate. A number of fluorinated compounds showed up well, also — compound types included mixed-halogen dinitrobenzenes, biphenyls and phenols. Low human hazard, as well as substantial effectiveness, caused the Air Force group to rate fluorinated biphenyls and diphenyl sulfide as top fungicides.

- Seeing the day when regulations on dairy cleaning detergents will demand a quaternary ammonium disinfectant that is effective in very hard waters, Rohm & Haas described a new quat it has developed (Experimental Quaternary 3104), which will work in hard (600 ppm.) water even when not sequestered. The new quat is priced at about \$1.20/lb., which classes it among the moderately priced materials.

- Peracetic acid aerosols sprays, for germicidal purposes, were examined from three standpoints—the



KLARMANN: For a growing organization, a new guiding hand.

raw materials, the packaging, and the germicidal activity. Though presented to the aerosol section, the papers fit in well with a disinfectant-sanitizer symposium to the Disinfectant group (concerned with phenolic, iodophor, quaternary, and chlorine-base products).

Who Sprays? Aerosolers also got new market facts—from the latest Du Pont survey of aerosol consumers, the fourth such study on consumer attitudes the firm has made. Among the pertinent data uncovered by the investigators:

- Based on interviews with some 4,305 families, it would seem that about 91% of U.S. households have

tried at least one of the different aerosols now available. Space insecticides are the most common item, with 76% respondents trying them, while 52-59% have sampled such big sellers as room deodorants, hair sprays, and nonspace insecticides.

- Shave creams, a "wonder product" as far as growth goes, now have been tried by nearly 27% of the families checked. Mothproofing compounds, however, outdistance shaves, as far as the number of triers goes (but not in number of actual units sold), with 37%.

- Snows, a seasonal item, have been tested by 38%.

- Families in rural areas, according to the survey, buy just as many (per capita) aerosols as do urban groups. Food and grocery stores are prime purchase points for insecticides and room deodorants; with drugstores favored for personal items.

Winner of the blue-ribbon, competing with 150 aerosol packages, was a Sears, Roebuck product, Cross Country Rose and Floral Spray, an insecticide. There were eight other winners, in various fields, besides the Sears product.*

Change in Command: Emil Klarman, Lehn & Fink Products Corp. (New York), took over the presidency of CSMA, from Melvin Fuld, who put in two years at its head. In addition, other new officers and a member of the board of governors were elected.†

Next meeting of the CSMA, its 42nd midyear session, will be in the Drake Hotel, Chicago, May 20-22.

*Room deodorants—Jetco Spring Blossom spray, Jewel Tea Co. (Barrington, Ill.); paint products—Dupli-Color Spray Enamel, Dupli-Color Products Co., Inc. (Chicago); miscellaneous household products—Fire Chief, fire extinguishing spray, Marlowe Chemical Co., Inc. (New York); shave products—Palmolive Rapid Shave Lather Cream, Colgate-Palmolive (Jersey City, N. J.); hair preparations — Blue Grass Hair Spray, Elizabeth Arden Sales Corp. (New York); miscellaneous personal products—Xpore Suntan Cream Lotion, Walgreen Drug Stores (Chicago); artificial snow—Christmas Snow Aerosol Co., Inc. (Neodesha, Kan.); industrial products—Rust Veto Spray, E. F. Houghton & Co. (Philadelphia); glass and plastic containers—Ambush, Spray Cologne, Dana Perfumes, Inc. (Chicago).

†First vice-president, Harry Peterson (Peterson Filling and Packaging Corp., Danville, Ill.); second vice-president, James Ferris (Niagara Alkali Co., New York); treasurer, Peter Reilly (Reilly Tar & Chemical Corp., Indianapolis); secretary, H. W. (Doc) Hamilton.
To the board of governors: Melvin Fuld (Fuld Brothers, Baltimore); Frederick Lodes (Precision Valve Corp., Yonkers, N. Y.); Ira MacNair (MacNair Dorland Co., New York).



GRANT'S GRANT*: Out of the dark with photographic paper.

Photos Without Silver

One of the earliest ways of detecting radioactivity (the way, for example, by which Becquerel discovered the radioactivity of pitchblend) was by fogging of photographic film. But this effect, though no longer a novelty, and very useful in devices such as radiation gauging and badges, sometimes proves more hindrance than help.

This is particularly true in scientific observation, where photography has proved a valuable tool—seeing in places where man can't go (such as in high-altitude rockets), making records of atomic blasts, or recording instrument readings with lasting accuracy. When used in thin atmosphere, however, as in the rockets, or around atomic phenomena, elaborate care must be taken to protect the film from radiation.

Let There Be Light: Now, using a process developed in Radio Corp. of America's Princeton, N.J., laboratory, a Cleveland photographic paper supplier, Grant Photo Products, Inc., is offering a radiationproof, versatile (doesn't need a metal plate) process reminiscent of the Haloid Co's. (Rochester, N.Y.) Xerography.

*Right: President G. Peter Grant; left: Technical Director Leonard R. Sainsbury.

And, aside from its resistance to radioactive fogging, the new method has other advantages. The materials are roughly 50% as costly as conventional photographic films, and the equipment required for development is only 10% as expensive. Handling is easier, too: the new film doesn't have to go into lightproof containers.

The process is completely dry, doesn't use silver, hypo or fixer, but works, rather, through electrostatic charging. Though it's a dry process, the new "film" is nevertheless dependent on chemical treatment.

Damp Paper: The basis of the process is a sheet of ordinary paper humidified until moisture content exceeds 6% (to give it an electrical conducting surface) on which is put a pigmented photoconductive resin coating (as an insulating surface). This is packaged in moisture retaining (not light-tight) envelopes.

To make the paper light-sensitive, it is electrically charged by passing it over a small wire grid carrying an extremely high voltage but low current, immediately prior to exposure. After exposure the image is developed by sprinkling another pigmented resin on the surface, fixed by briefly heating at around 150 C.

Speed Range: The papers will be supplied by Grant in a wide range of speeds to suit different exposure requirements. The paper is now available on a production basis, but the equipment is yet to come. Grant is working with Fairchild Camera and Instrument Co. (Syosset, N.Y.) on designs of automatic charging and developing machinery that can be installed either inside or immediately adjacent to ordinary photo reproduction or exposure equipment. When available, both the equipment and the paper will be marketed by Grant.


Six Poses: Grant expects the big markets to be in scientific instrument recording, office copy work, and engineering reproduction. Blueprints can be made with photographic quality at a cost comparable to present cruder methods, the company claims. One big customer is expected to be the aircraft industry, which uses photographic projections in making templates. The low cost and ease of handling will be the selling points here. One of the first uses for the new process will be in the "six-poses-for-a-quarter" coin picture machines, a business in which Grant is already a large supplier of film.

The photo firm is licensing the process on a nonexclusive basis from RCA. Although a number of other companies have taken out licenses, Grant is still the only producer. No one else has the machinery necessary to produce the paper—the others can only process it. All factors in the office copy field have expressed interest.

PATENTS

Easy Go: Although the enthusiasm about chlorophyll has largely faded, Colgate-Palmolive Co.'s recent British patent (739,944) bears interest—it covers a process to make the chlorophyll derivatives in dentifrices non-staining. Water-soluble polyvinyl pyrrolidone acts as the antistaining agent.

Burning Issue: The phosphates turn up again in an antifiame treatment for cellulose. Duane Kenaga and Arthur Erbel devised the compound for Dow (U.S. Pat. 2,725,311). From 5 to 40% of the compound, which is one of the bis-(ω -monohaloalkyl)- ω -monohaloalkane phosphonate type, is used in a volatile solvent, which is later removed.



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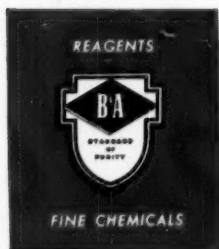
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